

# SIMATIC ET 200 distributed I/O

## ET 200pro

### I/O modules Digital expansion modules

#### Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
  - Standard modules with module-specific diagnostics
  - High-feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8DI and 8DO module by selecting CM IO 4 x M12 or CM IO 8 x M12

#### Technical specifications

|                                                     | 6ES7 141-4BF00-0AA0                                                                   | 6ES7 141-4BF00-0AB0                       | 6ES7 141-4BH00-0AA0                                                                   |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Supply voltages</b>                              |                                                                                       |                                           |                                                                                       |
| Rated value                                         |                                                                                       |                                           |                                                                                       |
| • 24 V DC                                           | Yes                                                                                   | Yes                                       | Yes                                                                                   |
| • permissible range, lower limit (DC)               | 20.4 V                                                                                | 20.4 V                                    | 20.4 V                                                                                |
| • permissible range, upper limit (DC)               | 28.8 V                                                                                | 28.8 V                                    | 28.8 V                                                                                |
| • Reverse polarity protection                       | Yes; against destruction; encoder power supply outputs applied with reversed polarity | Yes; against destruction; load increasing | Yes; against destruction; encoder power supply outputs applied with reversed polarity |
| <b>Current consumption</b>                          |                                                                                       |                                           |                                                                                       |
| from backplane bus 3.3 V DC, max.                   | 20 mA                                                                                 | 40 mA                                     | 20 mA                                                                                 |
| from supply voltage 1L+, max.                       | 20 mA                                                                                 | 20 mA                                     | 30 mA                                                                                 |
| <b>Power losses</b>                                 |                                                                                       |                                           |                                                                                       |
| Power loss, typ.                                    | 2.5 W                                                                                 | 2.5 W                                     | 3 W                                                                                   |
| <b>Address area</b>                                 |                                                                                       |                                           |                                                                                       |
| Occupied address area                               |                                                                                       |                                           |                                                                                       |
| • Inputs                                            | 1 byte                                                                                | 1 byte                                    | 2 byte                                                                                |
| <b>FH technology</b>                                |                                                                                       |                                           |                                                                                       |
| Module for fail-safe applications                   | No                                                                                    | No                                        |                                                                                       |
| <b>Isochronous mode</b>                             |                                                                                       |                                           |                                                                                       |
| Isochronous mode                                    | No                                                                                    | No                                        |                                                                                       |
| <b>Digital inputs</b>                               |                                                                                       |                                           |                                                                                       |
| Number of digital inputs                            | 8                                                                                     | 8                                         | 16                                                                                    |
| Number of simultaneously control-able inputs        |                                                                                       |                                           |                                                                                       |
| • all mounting positions                            |                                                                                       |                                           |                                                                                       |
| - up to 55 °C, max.                                 | 8                                                                                     | 8                                         | 16                                                                                    |
| Input characteristic curve acc. to IEC 1131, Type 1 | Yes                                                                                   | No                                        | Yes                                                                                   |
| Input characteristic curve acc. to IEC 1131, Type 2 | No                                                                                    | Yes                                       |                                                                                       |
| <b>Input voltage</b>                                |                                                                                       |                                           |                                                                                       |
| • Rated value, DC                                   | 24 V                                                                                  | 24 V                                      | 24 V                                                                                  |
| • for signal "0"                                    | -3 to +5 V                                                                            | -3 to +5 V                                | -3 to +5 V                                                                            |
| • for signal "1"                                    | 13 to 30 V                                                                            | 11 to 30 V                                | 11 to 30 V                                                                            |
| <b>Input current</b>                                |                                                                                       |                                           |                                                                                       |
| • for signal "1", typ.                              | 7 mA                                                                                  | 7 mA                                      | 4 mA                                                                                  |

**Technical specifications** (continued)

|                                                                       | 6ES7 141-4BF00-0AA0                       | 6ES7 141-4BF00-0AB0                      | 6ES7 141-4BH00-0AA0                       |
|-----------------------------------------------------------------------|-------------------------------------------|------------------------------------------|-------------------------------------------|
| Input delay<br>(for rated value of input voltage)                     |                                           |                                          |                                           |
| • for standard inputs                                                 | No                                        | Yes                                      | No                                        |
| - parameterizable                                                     | 1.2 ms                                    | 0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms        | 1.2 ms                                    |
| - at "0" to "1", min.                                                 | 4.8 ms                                    | 20 ms                                    | 4.8 ms                                    |
| - at "0" to "1", max.                                                 | 1.2 ms                                    | 0.5 ms; 0.5 ms/3 ms/15 ms/20 ms          | 0.7 ms                                    |
| - at "1" to "0", min.                                                 | 4.8 ms                                    | 20 ms                                    | 3 ms                                      |
| - at "1" to "0", max.                                                 |                                           |                                          |                                           |
| Cable length                                                          |                                           |                                          |                                           |
| • Cable length, shielded, max.                                        | 30 m                                      | 30 m                                     | 30 m                                      |
| • Cable length unshielded, max.                                       | 30 m                                      | 30 m                                     | 30 m                                      |
| <b>Encoder supply</b>                                                 |                                           |                                          |                                           |
| Number of outputs                                                     | 8                                         | 8                                        | 8                                         |
| Output current                                                        |                                           |                                          |                                           |
| • up to 55 °C, max.                                                   | 1 A                                       | 1 A                                      | 1 A                                       |
| <b>Encoder</b>                                                        |                                           |                                          |                                           |
| Connectable encoders                                                  |                                           |                                          |                                           |
| • 2-wire BEROs                                                        | Yes                                       | Yes                                      | Yes                                       |
| - permissible quiescent current<br>(2-wire BEROs), max.               | 1.5 mA                                    | 1.5 mA                                   | 1.5 mA                                    |
| <b>Parameter</b>                                                      |                                           |                                          |                                           |
| Diagnostic alarm                                                      |                                           | yes                                      |                                           |
| Process alarm                                                         |                                           | for 6 channels                           |                                           |
| Diagnostics: wire break                                               |                                           | channel by channel                       |                                           |
| Diagnostics: short circuit                                            | Sensor supply to M; module by module      | channel by channel                       |                                           |
| <b>Alarms/diagnostics/status information</b>                          |                                           |                                          |                                           |
| Diagnostics                                                           |                                           |                                          |                                           |
| • Diagnostic functions                                                | Yes                                       | Yes; channel by channel, parameterizable | Yes                                       |
| • Diagnostic information readable                                     | Yes                                       | Yes                                      | Yes                                       |
| • Wire break                                                          |                                           | Yes; monitoring, $I < 0.3 \text{ mA}$    |                                           |
| • Short circuit                                                       | Yes; Sensor supply to M; module by module | Yes                                      | Yes; sensor supply to M; module by module |
| • Group error                                                         |                                           |                                          | Yes                                       |
| diagnostic indication LED                                             |                                           |                                          |                                           |
| • Group error SF (red)                                                | Yes                                       | Yes                                      | Yes                                       |
| • Status indicator digital input (green)                              | Yes; per channel                          | Yes; per channel                         | Yes; per channel                          |
| <b>Isolation</b>                                                      |                                           |                                          |                                           |
| Isolation checked with                                                | 500 V DC                                  | 500 V DC                                 | 500 V DC                                  |
| <b>Galvanic isolation</b>                                             |                                           |                                          |                                           |
| Galvanic isolation digital inputs                                     |                                           |                                          |                                           |
| • between the channels                                                | No                                        | No                                       | No                                        |
| • between the channels and the backplane bus                          | Yes                                       | Yes                                      | Yes                                       |
| <b>Permissible potential difference</b><br>between different circuits | 75 V DC / 60 V AC                         | 75 V DC / 60 V AC                        | 75 V DC / 60 V AC                         |
| <b>Degree of protection</b>                                           |                                           |                                          |                                           |
| IP65                                                                  | Yes                                       | Yes                                      |                                           |
| IP66                                                                  | Yes                                       | Yes                                      |                                           |
| IP67                                                                  | Yes                                       | Yes                                      | Yes                                       |
| <b>Dimensions and weight</b>                                          |                                           |                                          |                                           |
| Dimensions                                                            |                                           |                                          |                                           |
| • Width                                                               | 45 mm                                     | 45 mm                                    | 45 mm                                     |
| • Height                                                              | 130 mm                                    | 130 mm                                   | 130 mm                                    |
| • Depth                                                               | 35 mm                                     | 35 mm; without terminal module           | 35 mm                                     |
| Weight                                                                |                                           |                                          |                                           |
| • Weight, approx.                                                     | 140 g                                     | 140 g                                    | 140 g                                     |

| Ordering data                                                                                                                                                                         |                            | Order No.                                                                                                                                   |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>8 DI digital input module</b><br>24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately                                     | <b>6ES7 141-4BF00-0AA0</b> | <b>CM IO 8 x M12 connection module</b><br>8 M12 sockets for connecting digital sensors or actuators to ET 200pro                            | <b>6ES7 194-4CB00-0AA0</b> |
| <b>8 DI High Feature digital input module</b><br>24 V DC, with channel-specific diagnostics, including bus module Connection module must be ordered separately                        | <b>6ES7 141-4BF00-0AB0</b> | <b>CM IO 8 x M12D connection module</b><br>8 M12 sockets for connecting digital sensors or actuators to ET 200pro                           | <b>6ES7 194-4CB50-0AA0</b> |
| <b>16 DI digital input module</b><br>24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES7 194-4CB50-0AA0 must be ordered separately                | <b>6ES7 141-4BH00-0AA0</b> | <b>CM IO 8 x M8 connection module</b><br>8 sockets M8 for connection of digital sensors or actuators to ET 200pro                           | <b>6ES7 194-4EB00-0AA0</b> |
| <b>4 DO digital output module</b><br>24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately                               | <b>6ES7 142-4BD00-0AA0</b> | <b>CM IO 2 x M12 connection module</b><br>2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A                       | <b>6ES7 194-4FB00-0AA0</b> |
| <b>4 DO High Feature digital output module</b><br>24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately                 | <b>6ES7 142-4BD00-0AB0</b> | <b>CM IO 1 x M23 connection module</b><br>1 socket M23; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A                              | <b>6ES7 194-4FA00-0AA0</b> |
| <b>8 DO digital output module</b><br>24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately                             | <b>6ES7 142-4BF00-0AA0</b> | <b>Module identification labels</b><br>For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each | <b>6ES7 194-4HA00-0AA0</b> |
| <b>Digital input and output module 4 DIO / 4 DO</b><br>24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately           | <b>6ES7 143-4BF00-0AA0</b> | <b>M12 sealing cap</b><br>For protection of unused M12 connections with ET 200pro                                                           | <b>3RX9 802-0AA00</b>      |
| <b>Accessories</b>                                                                                                                                                                    |                            | <b>Labels</b><br>20 x 7, pale turquoise, 340 units per pack                                                                                 | <b>3RT1 900-1SB20</b>      |
| <b>CM IO 4 x M12 connection module</b><br>4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro                                                            | <b>6ES7 194-4CA00-0AA0</b> | <b>Y circular connector M12</b><br>For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8                 | <b>6ES7 194-1KA01-0XA0</b> |
| <b>CM IO 4 x M12 inverse connection module</b><br>4 sockets M12 for connection of digital actuators to ET 200pro (4 DO and 4 DO HF); 2 x M12 singly occupied, 2 x M12 doubly occupied | <b>6ES7 194-4CA50-0AA0</b> | <b>Y cable M12</b><br>For double connection of I/O by means of a single-cable on ET200, 5-pole                                              | <b>6ES7 194-6KA00-0XA0</b> |
|                                                                                                                                                                                       |                            | <b>M8 sealing cap</b><br>For IP 67 modules                                                                                                  | <b>3RK1 901-1PN00</b>      |

I: Subject to export regulations AL: N and ECCN: EAR99H