



SIMATIC S7-400, digital input SM 421, isolated 16 DI; 24 V DC with 0.05 ms input delay alarm, diagnostics

| Supply voltage                                        |                               |
|-------------------------------------------------------|-------------------------------|
| Load voltage L+                                       |                               |
| • Rated value (DC)                                    | 24 V                          |
| • permissible range, lower limit (DC)                 | 20.4 V                        |
| • permissible range, upper limit (DC)                 | 28.8 V                        |
| • Reverse polarity protection                         | Yes                           |
| Input current                                         |                               |
| from supply voltage L+, max.                          | 120 mA                        |
| from backplane bus 5 V DC, max.                       | 130 mA                        |
| Encoder supply                                        |                               |
| Number of outputs                                     | 2                             |
| Type of output voltage                                | L+ (-2.5 V)                   |
| Short-circuit protection                              | Yes; Electronic               |
| additional (redundant) feed                           | Yes; possible                 |
| Output current                                        |                               |
| • Rated value                                         | 120 mA                        |
| • permissible range, lower limit                      | 0 mA                          |
| • permissible range, upper limit                      | 150 mA                        |
| Power loss                                            |                               |
| Power loss, typ.                                      | 5 W                           |
| Digital inputs                                        |                               |
| Number of digital inputs                              | 16                            |
| Input characteristic according to IEC 61131           | Type 2                        |
| Number of simultaneously controllable inputs          |                               |
| • Number of simultaneously controllable inputs        | 16                            |
| Input voltage                                         |                               |
| • Type of input voltage                               | DC                            |
| • Rated value (DC)                                    | 24 V                          |
| • for signal "0"                                      | -30 V DC to +5 V DC           |
| • for signal "1"                                      | 11 V DC to 30 V DC            |
| Input current                                         |                               |
| • for signal "0", min.                                | 6 mA; < 6 mA                  |
| • for signal "1", typ.                                | 6 mA; 6 to 8 mA               |
| Input delay (for rated value of input voltage)        |                               |
| • Input frequency (with a time delay of 0.1 ms), max. | 2 kHz                         |
| for standard inputs                                   |                               |
| — parameterizable                                     | Yes                           |
| — at "0" to "1", min.                                 | 3 µs; 0.05 / 0.1 / 0.5 / 3 ms |
| Encoder connection                                    |                               |

|                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|----------------|--------|----|-------------|--------|----|-------------|--------|----|-------------|--------|-----|-------------|--------|---|-------------|--------|---|-------------|--------|-----|-------------|--------|---|-------------|------|----|----------|------|---|----------|------|---|----------|------|---|----------|------|---|------|--------|----|-------------|
| <ul style="list-style-type: none"><li>• Fixed current limitation for wire-break monitoring, min.</li><li>• Fixed current limitation for wire-break monitoring, max.</li></ul>                                                                       | 10 kΩ<br>18 kΩ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Cable length                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| <ul style="list-style-type: none"><li>• shielded, max.</li><li>• unshielded, max.</li></ul>                                                                                                                                                         | 1 000 m; 1 000 m: 3 ms, 70 m: 0.5 ms, 30 m: 0.1 ms, 30 m: 0.05 ms<br>600 m; 600 m: 3 ms; 50 m: 0,5 ms; 20 m: 0,1 ms; 20 m: 0,05 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Encoder                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Connectable encoders                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| <ul style="list-style-type: none"><li>• 2-wire sensor</li><li>— permissible quiescent current (2-wire sensor), max.</li></ul>                                                                                                                       | Yes<br>3 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Interrupts/diagnostics/status information                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Diagnostics function                                                                                                                                                                                                                                | Yes; Parameterizable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Alarms                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| <ul style="list-style-type: none"><li>• Diagnostic alarm</li><li>• Hardware interrupt</li></ul>                                                                                                                                                     | Yes; Parameterizable<br>Yes; Parameterizable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Diagnoses                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| <ul style="list-style-type: none"><li>• Diagnostic information readable</li><li>• Monitoring the supply voltage</li><li>• Wire break</li></ul>                                                                                                      | Yes<br>Yes<br>Yes; I < 1 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Diagnostics indication LED                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| <ul style="list-style-type: none"><li>• Rated load voltage PWR (green)</li><li>• internal fault INTF (red)</li><li>• external fault EXTF (red)</li><li>• Status indicator digital input (green)</li><li>• Channel fault indicator F (red)</li></ul> | Yes; Per group<br>Yes<br>Yes<br>Yes<br>No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Potential separation                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Potential separation digital inputs                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| <ul style="list-style-type: none"><li>• between the channels</li><li>• between the channels, in groups of</li><li>• between the channels and backplane bus</li></ul>                                                                                | Yes<br>8<br>Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Isolation                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Isolation tested with                                                                                                                                                                                                                               | 500 V DC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Dimensions                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Width                                                                                                                                                                                                                                               | 25 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Height                                                                                                                                                                                                                                              | 290 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Depth                                                                                                                                                                                                                                               | 210 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Weights                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Weight, approx.                                                                                                                                                                                                                                     | 600 g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Classifications                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
|                                                                                                                                                                                                                                                     | <table><tr><td></td><td>Version</td><td>Classification</td></tr><tr><td>eClass</td><td>16</td><td>27-24-22-04</td></tr><tr><td>eClass</td><td>14</td><td>27-24-22-04</td></tr><tr><td>eClass</td><td>12</td><td>27-24-22-04</td></tr><tr><td>eClass</td><td>9.1</td><td>27-24-22-04</td></tr><tr><td>eClass</td><td>9</td><td>27-24-22-04</td></tr><tr><td>eClass</td><td>8</td><td>27-24-22-04</td></tr><tr><td>eClass</td><td>7.1</td><td>27-24-22-04</td></tr><tr><td>eClass</td><td>6</td><td>27-24-22-04</td></tr><tr><td>ETIM</td><td>10</td><td>EC001419</td></tr><tr><td>ETIM</td><td>9</td><td>EC001419</td></tr><tr><td>ETIM</td><td>8</td><td>EC001419</td></tr><tr><td>ETIM</td><td>7</td><td>EC001419</td></tr><tr><td>IDEA</td><td>4</td><td>3566</td></tr><tr><td>UNSPSC</td><td>15</td><td>32-15-17-05</td></tr></table> |                | Version | Classification | eClass | 16 | 27-24-22-04 | eClass | 14 | 27-24-22-04 | eClass | 12 | 27-24-22-04 | eClass | 9.1 | 27-24-22-04 | eClass | 9 | 27-24-22-04 | eClass | 8 | 27-24-22-04 | eClass | 7.1 | 27-24-22-04 | eClass | 6 | 27-24-22-04 | ETIM | 10 | EC001419 | ETIM | 9 | EC001419 | ETIM | 8 | EC001419 | ETIM | 7 | EC001419 | IDEA | 4 | 3566 | UNSPSC | 15 | 32-15-17-05 |
|                                                                                                                                                                                                                                                     | Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Classification |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| eClass                                                                                                                                                                                                                                              | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 27-24-22-04    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| eClass                                                                                                                                                                                                                                              | 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 27-24-22-04    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| eClass                                                                                                                                                                                                                                              | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 27-24-22-04    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| eClass                                                                                                                                                                                                                                              | 9.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 27-24-22-04    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| eClass                                                                                                                                                                                                                                              | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 27-24-22-04    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| eClass                                                                                                                                                                                                                                              | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 27-24-22-04    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| eClass                                                                                                                                                                                                                                              | 7.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 27-24-22-04    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| eClass                                                                                                                                                                                                                                              | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 27-24-22-04    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| ETIM                                                                                                                                                                                                                                                | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | EC001419       |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| ETIM                                                                                                                                                                                                                                                | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | EC001419       |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| ETIM                                                                                                                                                                                                                                                | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | EC001419       |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| ETIM                                                                                                                                                                                                                                                | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | EC001419       |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| IDEA                                                                                                                                                                                                                                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3566           |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| UNSPSC                                                                                                                                                                                                                                              | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 32-15-17-05    |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| Approvals / Certificates                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |
| General Product Approval                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |         |                |        |    |             |        |    |             |        |    |             |        |     |             |        |   |             |        |   |             |        |     |             |        |   |             |      |    |          |      |   |          |      |   |          |      |   |          |      |   |      |        |    |             |



[Miscellaneous](#)



General Product Approval

EMV

For use in hazardous locations

[China RoHS](#)

[Miscellaneous](#)

[Manufacturer Declaration](#)



For use in hazardous locations



[FM](#)



[Type Examination Certificate](#)



Maritime application



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