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| range of product | Modicon M221 |
| product or component type | logic controller |
| [Us] rated supply voltage | 24 V DC |
| discrete input number | 14 discrete input conforming to IEC 61131-2 Type 1 including 4 fast input |
| analogue input number | 2 at input range: 0...10 V |
| discrete output type | transistor |
| discrete output number | 10 transistor including 2 fast output |
| discrete output voltage | 24 V DC |
| discrete output current | 0.5 A |

Complementary

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| discrete I/O number | 24 |
| number of I/O expansion module | <= 7 transistor output <= 7 relay output |
| supply voltage limits | 20.4...28.8 V |
| inrush current | <= 35 A |
| power consumption in W | <= 13 Wat 24 V with max number of I/O expansion module <= 4.1 Wat 24 V without I/O expansion module |
| power supply output current | 0.52 A at 5 V expansion bus 0.2 A at 24 V expansion bus |
| discrete input logic | sink or source (positive/negative) |
| discrete input voltage | 24 V |
| discrete input voltage type | DC |
| analogue input resolution | 10 bits |
| LSB value | 10 mV |
| conversion time | 1 ms per channel + 1 controller cycle time analog input |
| permitted overload on inputs | +/- 30 V DC analog input with 5 min maximum +/- 13 V DC analog input permanent |
| voltage state 1 guaranteed | >= 15 V input |
| voltage state 0 guaranteed | <= 5 V input |
| discrete input current | 7 mA discrete input 5 mA fast input |
| input impedance | 3.4 kOhm discrete input |

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| | 100 kOhm analog input 4.9 kOhm fast input |
| response time | 35 µs turn-off operation for input; I2...I5 terminal I0, I1, I6, I7 Klemme' andere Klemmen Klemme' I0, I1, I6, I7 Klemme' andere Klemmen Klemme' Q0...Q1 Klemme' Q2...Q3 Klemme' andere Klemmen Klemme' |
| configurable filtering time | 0 ms input 3 ms input 12 ms input |
| discrete output logic | positive logic (source) |
| current per output common | 5 A |
| output frequency | 100 kHz fast output (PWM/PLS mode) at Q0...Q1 terminal 5 kHz output at Q2...Q3 terminal 0.1 kHz output at Q4...Q9 terminal |
| absolute accuracy error | +/- 1 % of full scale analog input |
| leakage current | 0.1 mA transistor output |
| voltage drop | <= 1 V |
| mechanical durability | >= 20000000 cycles transistor output |
| tungsten load | <= 12 W output and fast output |
| protection type | overload and short-circuit protection at 1 A |
| reset time | 1 s automatic reset |
| memory capacity | 256 kB user application and data RAM with 10000 instructions 256 kB internal variables RAM |
| data backed up | 256 kB built-in flash memory backup of application and data |
| data storage equipment | 2 GB SD card optional |
| battery type | BR2032 lithium non-rechargeable, battery life: 4 yr |
| backup time | 1 year at 77 °F (25 °C) by interruption of power supply |
| execution time for 1 KInstruction | 0.3 ms event and periodic task |
| execution time per instruction | 0.2 µs Boolean |
| exct time for event task | 60 µs response time |
| maximum size of object areas | 512 %M memory bits 8000 %MW memory words 512 %KW constant words 255 %TM timers 255 %C counters |
| realtime clock | with |
| clock drift | <= 30 s/month at 77 °F (25 °C) |
| regulation loop | adjustable PID regulator up to 14 simultaneous loops |
| positioning functions | position PTO 2 axe(s) pulse/direction mode (100 kHz) position PTO 1 axe(s) CW/CCW mode (100 kHz) |
| function available | PWM PLS frequency generator |
| counting input number | 4 fast input (HSC mode) (counting frequency: 100 kHz), counting capacity: 32 bits |
| control signal type | A/B pulse/direction single phase |
| integrated connection type | USB port with connector mini B USB 2.0 non isolated serial link "serial 1" with connector RJ45 and interface RS485 non isolated serial link "serial 2" with connector RJ45 and interface RS232/RS485 |
| supply | serial serial link supply at 5 V 200 mA |
| transmission rate | 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m - communication protocol: RS485 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 9.84 ft (3 m) - communication protocol: RS232 480 Mbit/s - communication protocol: USB |

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| communication port protocol | USB port: USB protocol - SoMachine-Network non isolated serial link: Modbus protocol master/slave - RTU/ASCII or SoMachine-Network |
| local signalling | 1 LED green PWR 1 LED green RUN 1 LED red module error (ERR) 1 LED green SD card access (SD) 1 LED red BAT 1 LED green SL1 1 LED green SL2 1 LED per channel green I/O state |
| electrical connection | removable screw terminal block for inputs removable screw terminal block for outputs terminal block, 3 terminal(s) for connecting the 24 V DC power supply connector, 4 terminal(s) for analogue inputs mini B USB 2.0 connector for a programming terminal |
| cable distance between devices | shielded cable: 10 m for fast input unshielded cable: 30 m for output unshielded cable: 30 m for digital input unshielded cable: 1 m for analog input shielded cable: 3 m for fast output |
| insulation | 500 V AC between input and internal logic 500 V AC between fast input and internal logic non-insulated between inputs 500 V AC between output and internal logic non-insulated between analogue input and internal logic non-insulated between analogue inputs |
| marking | CE |
| mounting support | top hat type TH35-15 rail conforming to IEC 60715 top hat type TH35-7.5 rail conforming to IEC 60715 plate or panel with fixing kit |
| height | 3.54 in (90 mm) |
| depth | 2.76 in (70 mm) |
| width | 4.33 in (110 mm) |
| product weight | 0.87 lb(US) (0.395 kg) |

Environment

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| standards | EN/IEC 60664-1 EN/IEC 61131-2 EN/IEC 61010-2-201 |
| product certifications | ABS CSA cULus LR IACS E10 RCM EAC DNV-GL |
| environmental characteristic | ordinary and hazardous location |
| resistance to electrostatic discharge | 8 kV in air conforming to EN/IEC 61000-4-2 4 kV on contact conforming to EN/IEC 61000-4-2 |
| resistance to electromagnetic fields | 9.14 V/yd (10 V/m) (80 MHz...1 GHz) conforming to EN/IEC 61000-4-3 2.74 V/yd (3 V/m) (1.4 GHz...2 GHz) conforming to EN/IEC 61000-4-3 1 V/m (2...2.7 GHz) conforming to EN/IEC 61000-4-3 |
| resistance to magnetic fields | 30 A/m 50/60 Hz conforming to EN/IEC 61000-4-8 |
| resistance to fast transients | 2 kV power lines conforming to EN/IEC 61000-4-4 2 kV relay output conforming to EN/IEC 61000-4-4 1 kV I/O conforming to EN/IEC 61000-4-4 1 kV Ethernet line conforming to EN/IEC 61000-4-4 1 kV serial link conforming to EN/IEC 61000-4-4 |
| surge withstand | 2 kV power lines (AC) in common mode conforming to EN/IEC 61000-4-5 2 kV relay output in common mode conforming to EN/IEC 61000-4-5 1 kV I/O in common mode conforming to EN/IEC 61000-4-5 1 kV shielded cable in common mode conforming to EN/IEC 61000-4-5 0.5 kV power lines (DC) in differential mode conforming to EN/IEC 61000-4-5 |

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| | 1 kV power lines (AC) in differential mode conforming to EN/IEC 61000-4-5 1 kV relay output in differential mode conforming to EN/IEC 61000-4-5 0.5 kV power lines (DC) in common mode conforming to EN/IEC 61000-4-5 |
| resistance to conducted disturbances | 10 Vrms (0.15...80 MHz) conforming to EN/IEC 61000-4-6 3 Vrms (0.1...80 MHz) conforming to Marine specification (LR, ABS, DNV, GL) 10 Vrms (spot frequency (2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz)) conforming to Marine specification (LR, ABS, DNV, GL) |
| electromagnetic emission | conducted emissions conforming to EN/IEC 55011 power lines (AC), 0.15...0.5 MHz: 79 dB μ V/m QP/66 dB μ V/m AV conducted emissions conforming to EN/IEC 55011 power lines (AC), 0.5...300 MHz: 73 dB μ V/m QP/60 dB μ V/m AV conducted emissions conforming to EN/IEC 55011 power lines, 10...150 kHz: 120...69 dB μ V/m QP conducted emissions conforming to EN/IEC 55011 power lines, 1.5...30 MHz: 63 dB μ V/m QP radiated emissions conforming to EN/IEC 55011 class A 10 m, 30...230 MHz: 40 dB μ V/m QP conducted emissions conforming to EN/IEC 55011 power lines, 150...1500 kHz : 79...63 dB μ V/m QP radiated emissions conforming to EN/IEC 55011 class A 10 m, 200...1000 MHz : 47 dB μ V/m QP |
| immunity to microbreaks | 10 ms |
| ambient air temperature for operation | 14...131 °F (-10...55 °C) horizontal installation -10...35 °C vertical installation |
| ambient air temperature for storage | -13...158 °F (-25...70 °C) |
| relative humidity | 10...95 % without condensation in operation 10...95 % without condensation in storage |
| IP degree of protection | IP20 with protective cover in place |
| pollution degree | <= 2 |
| operating altitude | 0...6561.68 ft (0...2000 m) |
| storage altitude | 0...9842.52 ft (0...3000 m) |
| vibration resistance | 3.5 mm (vibration frequency: 5...8.4 Hz) on symmetrical rail 3.5 mm (vibration frequency: 5...8.4 Hz) on panel mounting 1 gn (vibration frequency: 8.4...150 Hz) on symmetrical rail 1 gn (vibration frequency: 8.4...150 Hz) on panel mounting |
| shock resistance | 147 m/s ² (test wave duration:11 ms) |

Offer Sustainability

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| Sustainable offer status | Green Premium product |
| RoHS (date code: YYWW) | Compliant - since 1415 - Schneider Electric declaration of conformity |
| REACH | Reference not containing SVHC above the threshold |
| Product environmental profile | Available |
| Product end of life instructions | Available |