




SIMATIC ET 200AL, AQ 4xU/I, 4xM12, Degree of protection IP67

| General information  |  |
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| Product type designation   | AQ 4xU/I   |
| HW functional status   | from FS04  |
| Firmware version   | V1.0.x   |
| Product function   |  |
| <ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>   | Yes; I&M0 to I&M3  |
| Engineering with   |  |
| <ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul> | STEP 7 V14 or higher   |
| <ul style="list-style-type: none"> <li>STEP 7 configurable/integrated from version</li> </ul>            | V5.5 SP4 Hotfix 7 or higher  |
| <ul style="list-style-type: none"> <li>PROFIBUS from GSD version/GSD revision</li> </ul>                 | GSD as of Revision 5   |
| <ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>                 | GSDML V2.3.1   |
| Supply voltage   |  |
| power supply according to NEC Class 2 required   | No   |
| Load voltage 1L+   |  |
| <ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>                                       | 24 V   |
| <ul style="list-style-type: none"> <li>permissible range, lower limit (DC)</li> </ul>                    | 20.4 V   |
| <ul style="list-style-type: none"> <li>permissible range, upper limit (DC)</li> </ul>                    | 28.8 V   |
| <ul style="list-style-type: none"> <li>Reverse polarity protection</li> </ul>                            | Yes; Against destruction; actuator power supply outputs applied with reversed polarity |
| Input current  |  |
| Current consumption (rated value)  | 110 mA; without load   |
| from load voltage 1L+ (unswitched voltage)   | 4 A; Maximum value   |
| from load voltage 2L+, max.  | 4 A; Maximum value   |
| Actuator supply  |  |
| Number of outputs  | 4  |
| Short-circuit protection   | Yes; per module, electronic  |
| Output current   |  |
| <ul style="list-style-type: none"> <li>Rated value</li> </ul>  | Total current 1 A up to 45 °C; 0.5 A up to 55 °C                                       |
| Power loss   |  |
| Power loss, typ.   | 2.6 W  |
| Analog outputs   |  |
| Number of analog outputs   | 4  |
| Voltage output, short-circuit protection   | Yes  |
| Voltage output, short-circuit current, max.  | 24 mA  |
| Current output, no-load voltage, max.  | 15 V   |
| Cycle time (all channels) max.   | 1 ms   |
| Output ranges, voltage   |  |
| <ul style="list-style-type: none"> <li>0 to 10 V</li> </ul>  | Yes; 15 bit  |

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| <ul style="list-style-type: none"> <li>• 1 V to 5 V</li> <li>• -10 V to +10 V</li> </ul>   | Yes; 14 bit<br>Yes; 16 bit incl. sign  |
| <b>Output ranges, current</b>  |  |
| <ul style="list-style-type: none"> <li>• 0 to 20 mA</li> <li>• -20 mA to +20 mA</li> <li>• 4 mA to 20 mA</li> </ul>  | Yes; 15 bit<br>Yes; 16 bit incl. sign<br>Yes; 14 bit   |
| <b>Connection of actuators</b>   |  |
| <ul style="list-style-type: none"> <li>• for voltage output two-wire connection</li> <li>• for voltage output four-wire connection</li> <li>• for current output two-wire connection</li> <li>• for current output four-wire connection</li> </ul> | Yes<br>Yes<br>Yes<br>Yes   |
| <b>Load impedance (in rated range of output)</b>   |  |
| <ul style="list-style-type: none"> <li>• with voltage outputs, min.</li> <li>• with voltage outputs, capacitive load, max.</li> <li>• with current outputs, max.</li> <li>• with current outputs, inductive load, max.</li> </ul>                  | 1 k $\Omega$<br>1 $\mu$ F<br>500 $\Omega$<br>1 mH  |
| <b>Destruction limits against externally applied voltages and currents</b>   |  |
| <ul style="list-style-type: none"> <li>• Voltages at the outputs towards MANA</li> </ul>   | 16 V   |
| <b>Cable length</b>  |  |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>   | 30 m   |
| <b>Analog value generation for the outputs</b>   |  |
| <b>Integration and conversion time/resolution per channel</b>  |  |
| <ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> </ul>   | 16 bit   |
| <b>Settling time</b>   |  |
| <ul style="list-style-type: none"> <li>• for resistive load</li> <li>• for capacitive load</li> <li>• for inductive load</li> </ul>  | 1 ms<br>1 ms<br>1 ms   |
| <b>Errors/accuracies</b>   |  |
| Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)   | 0.02 %   |
| Linearity error (relative to output range), (+/-)  | 0.1 %  |
| Temperature error (relative to output range), (+/-)  | 0.005 %/K  |
| Crosstalk between the outputs, max.  | -70 dB   |
| Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)   | 0.03 %   |
| <b>Operational error limit in overall temperature range</b>  |  |
| <ul style="list-style-type: none"> <li>• Voltage, relative to output range, (+/-)</li> <li>• Current, relative to output range, (+/-)</li> </ul>   | 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C<br>0.25 %   |
| <b>Basic error limit (operational limit at 25 °C)</b>  |  |
| <ul style="list-style-type: none"> <li>• Voltage, relative to output range, (+/-)</li> <li>• Current, relative to output range, (+/-)</li> </ul>   | 0.15 %<br>0.15 %   |
| <b>Interrupts/diagnostics/status information</b>   |  |
| Substitute values connectable  | Yes; channel by channel, parameterizable   |
| <b>Alarms</b>  |  |
| <ul style="list-style-type: none"> <li>• Diagnostic alarm</li> </ul>   | Yes; Parameterizable   |
| <b>Diagnoses</b>   |  |
| <ul style="list-style-type: none"> <li>• Wire-break</li> <li>• Short-circuit</li> </ul>  | Yes; channel-by-channel, only for output type "current"<br>Yes; Actuator supply module by module; channel by channel for output type "voltage" |
| <b>Diagnostics indication LED</b>  |  |
| <ul style="list-style-type: none"> <li>• Channel status display</li> <li>• for module diagnostics</li> </ul>   | Yes; green LED<br>Yes; green/red LED   |
| <b>Potential separation</b>  |  |
| between the load voltages  | Yes  |
| <b>Potential separation channels</b>   |  |
| <ul style="list-style-type: none"> <li>• between the channels</li> <li>• between the channels and backplane bus</li> <li>• between the channels and the power supply of the electronics</li> </ul>   | No<br>Yes<br>No  |
| <b>Isolation</b>   |  |

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| Isolation tested with  | 707 V DC (type test)   |
| <b>Degree and class of protection</b>  |  |
| IP degree of protection  | IP65/67  |
| <b>Standards, approvals, certificates</b>  |  |
| Suitable for safety-related tripping of standard modules   | Yes; from FS04   |
| Highest safety class achievable for safety-related tripping of standard modules  |  |
| <ul style="list-style-type: none"> <li>• Performance level according to ISO 13849-1</li> <li>• Category according to ISO 13849-1</li> <li>• SIL acc. to IEC 62061</li> </ul> | PL d<br>Cat. 3<br>SIL 2  |
| <b>Ambient conditions</b>  |  |
| Ambient temperature during operation   |  |
| <ul style="list-style-type: none"> <li>• min.</li> <li>• max.</li> </ul>   | -30 °C<br>55 °C  |
| <b>connection method / header</b>  |  |
| Design of electrical connection for the inputs and outputs   | M12, 5-pole  |
| Design of electrical connection for supply voltage   | M8, 4-pole   |
| ET-Connection  |  |
| <ul style="list-style-type: none"> <li>• ET-Connection</li> </ul>  | M8, 4-pin, shielded  |
| <b>Dimensions</b>  |  |
| Width  | 30 mm  |
| Height   | 159 mm   |
| Depth  | 40 mm  |
| <b>Weights</b>   |  |
| Weight, approx.  | 175 g  |
| <b>last modified:</b>  | 3/7/2022  |