

SIMATIC S7-1500, ANALOG OUTPUT MODULE AQ 4 X U/I ST; 16 BITS OF RESOLUTION, ACCURACY 0.3 %; 4 CHANNELS IN GROUPS OF 4; DIAGNOSIS, SUBSTITUTE VALUE INCL. INFEEED ELEMENT, SHIELD CLAMP AND SHIELD TERMINAL



| General information                                       |                   |
|-----------------------------------------------------------|-------------------|
| Product type designation                                  | AQ 4xU/I ST       |
| HW functional status                                      | FS01              |
| Firmware version                                          | V2.0.0            |
| • FW update possible                                      | Yes               |
| Product function                                          |                   |
| • I&M data                                                | Yes; I&M0 to I&M3 |
| • Output range scalable                                   | No                |
| Engineering with                                          |                   |
| • STEP 7 TIA Portal configurable/integrated as of version | V12 / V12         |
| • STEP 7 configurable/integrated as of version            | V5.5 SP3 / -      |
| • PROFIBUS as of GSD version/GSD revision                 | V1.0 / V5.1       |
| • PROFINET as of GSD version/GSD revision                 | V2.3 / -          |
| Operating mode                                            |                   |
| • Oversampling                                            | No                |
| • MSO                                                     | Yes               |
| CiR – Configuration in RUN                                |                   |

|                                                  |                                                     |
|--------------------------------------------------|-----------------------------------------------------|
| Reparameterization possible in RUN               | Yes                                                 |
| Calibration possible in RUN                      | Yes                                                 |
| <b>Supply voltage</b>                            |                                                     |
| 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                                                 |
| <b>Input current</b>                             |                                                     |
| Current consumption, max.                        | 190 mA; with 24 V DC supply                         |
| <b>Power</b>                                     |                                                     |
| Power available from the backplane bus           | 0.6 W                                               |
| <b>Power loss</b>                                |                                                     |
| Power loss, typ.                                 | 4 W                                                 |
| <b>Analog outputs</b>                            |                                                     |
| 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.            | 22 V                                                |
| Cycle time (all channels), min.                  | 3.2 ms; independent of number of activated channels |
| <b>Output ranges, voltage</b>                    |                                                     |
| • 0 to 10 V                                      | Yes                                                 |
| • 1 V to 5 V                                     | Yes                                                 |
| • -5 V to +5 V                                   | No                                                  |
| • -10 V to +10 V                                 | Yes                                                 |
| <b>Output ranges, current</b>                    |                                                     |
| • 0 to 20 mA                                     | Yes                                                 |
| • -20 mA to +20 mA                               | Yes                                                 |
| • 4 mA to 20 mA                                  | Yes                                                 |
| <b>Connection of actuators</b>                   |                                                     |
| • for voltage output two-wire connection         | Yes                                                 |
| • for voltage output four-wire connection        | Yes                                                 |
| • for current output two-wire connection         | Yes                                                 |
| <b>Load impedance (in rated range of output)</b> |                                                     |
| • with voltage outputs, min.                     | 1 k $\Omega$ ; 0.5 k $\Omega$ m at 1 to 5 V         |
| • with voltage outputs, capacitive load, max.    | 1 $\mu$ F                                           |
| • with current outputs, max.                     | 750 $\Omega$                                        |
| • with current outputs, inductive load, max.     | 10 mH                                               |
| <b>Cable length</b>                              |                                                     |
| • shielded, max.                                 | 800 m; for current, 200 m for voltage               |
| <b>Analog value generation for the outputs</b>   |                                                     |

|                                                                            |                                     |
|----------------------------------------------------------------------------|-------------------------------------|
| <b>Integration and conversion time/resolution per channel</b>              |                                     |
| • Resolution with overrange (bit including sign), max.                     | 16 bit                              |
| • Conversion time (per channel)                                            | 0.5 ms                              |
| <b>Settling time</b>                                                       |                                     |
| • for resistive load                                                       | 1.5 ms                              |
| • for capacitive load                                                      | 2.5 ms                              |
| • for inductive load                                                       | 2.5 ms                              |
| <b>Errors/accuracies</b>                                                   |                                     |
| Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)     | 0.02 %                              |
| Linearity error (relative to output range), (+/-)                          | 0.15 %                              |
| Temperature error (relative to output range), (+/-)                        | 0.002 %/K                           |
| Crosstalk between the outputs, max.                                        | -100 dB                             |
| Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) | 0.05 %                              |
| <b>Operational error limit in overall temperature range</b>                |                                     |
| • Voltage, relative to output range, (+/-)                                 | 0.3 %                               |
| • Current, relative to output range, (+/-)                                 | 0.3 %                               |
| <b>Basic error limit (operational limit at 25 °C)</b>                      |                                     |
| • Voltage, relative to output range, (+/-)                                 | 0.2 %                               |
| • Current, relative to output range, (+/-)                                 | 0.2 %                               |
| <b>Isochronous mode</b>                                                    |                                     |
| Isochronous operation (application synchronized up to terminal)            | No                                  |
| <b>Interrupts/diagnostics/status information</b>                           |                                     |
| Diagnostics function                                                       | Yes                                 |
| Substitute values connectable                                              | Yes                                 |
| <b>Alarms</b>                                                              |                                     |
| • Diagnostic alarm                                                         | Yes                                 |
| <b>Diagnostic messages</b>                                                 |                                     |
| • Monitoring the supply voltage                                            | Yes                                 |
| • Wire-break                                                               | Yes; Only for output type "current" |
| • Short-circuit                                                            | Yes; Only for output type "voltage" |
| • Overflow/underflow                                                       | Yes                                 |
| <b>Diagnostics indication LED</b>                                          |                                     |
| • RUN LED                                                                  | Yes; Green LED                      |
| • ERROR LED                                                                | Yes; Red LED                        |
| • Monitoring of the supply voltage (PWR-LED)                               | Yes; Green LED                      |
| • Channel status display                                                   | Yes; Green LED                      |
| • for channel diagnostics                                                  | Yes; Red LED                        |
| • for module diagnostics                                                   | Yes; Red LED                        |

|                                            |                      |
|--------------------------------------------|----------------------|
| Potential separation                       |                      |
| Potential separation channels              |                      |
| • between the channels                     | No                   |
| • between the channels, in groups of       | 4                    |
| • between the channels and backplane bus   | Yes                  |
| • Between the channels and load voltage L+ | Yes                  |
| Permissible potential difference           |                      |
| between S- and MANA (UCM)                  | 8 V DC               |
| Isolation                                  |                      |
| Isolation tested with                      | 707 V DC (type test) |
| Decentralized operation                    |                      |
| Prioritized startup                        | No                   |
| Dimensions                                 |                      |
| Width                                      | 35 mm                |
| Height                                     | 147 mm               |
| Depth                                      | 129 mm               |
| Weights                                    |                      |
| Weight, approx.                            | 310 g                |
| last modified:                             | 01/21/2017           |