Data sheet

SIMATIC S7-1500, Analog output module AQ8xU/I HS, 16 bit resolution, Accuracy 0.3%, 8 channels in groups of 8, diagnostics; Substitute value 8 channels in 0.125 ms oversampling incl. infeed element, Shield bracket and shield terminal



Figure similar

| General information | |
|---|-------------------|
| Product type designation | AQ 8xU/I HS |
| HW functional status | FS01 |
| Firmware version | V2.1.0 |
| 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 | V14 / - |
| 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 | Yes |
| • MSO | Yes |

| Reparameterization possible in RUN Yes Calibration possible in RUN Yes Supply voltage Type of supply voltage Rated value (DC) 24 V Permissible range, lower limit (DC) Permissible range, upper limit (DC) Power Power available from the backplane bus 1.15 W Power loss Power loss Power loss Power loss, typ. 7 W Analog outputs Number of analog outputs 8 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 45 mA Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 125 μs; independent of number of activated channels Output ranges, voltage • 1 to 10 V • Yes • 1 V to 5 V • 1 V to 4 V V • 1 V to 5 V • 1 V to 4 V V • 1 V to 4 V V • 1 V to 4 V V • 1 V to 5 V • 1 V to 4 V V • 1 V to 5 V • 1 V to 4 V V • 1 V to 5 V • 1 V to 4 V V • 1 V to 5 V • 1 V to 4 V V • 1 V to 5 V • | CiR – Configuration in RUN | | |
|---|---|---|--|
| Supply voltage Type of supply voltage DC Ratad value (DC) 24 V permissible range, lower limit (DC) 20.4 V permissible range, upper limit (DC) 28.8 V Reverse polarity protection Yes | | Vas | |
| Type of supply voltage Type of supply voltage Rated value (DC) Permissible range, lower limit (DC) Permissible range, upper limit (DC) Reverse polarity protection Yes Input current Current consumption, max. 260 mA; with 24 V DC supply Power Power variable from the backplane bus 1.15 W Power loss Power loss, typ. 7 W Analog outputs Number of analog outputs Voltage output, short-circuit current, max. 45 mA Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 25 μs; independent of number of activated channels Output ranges, voltage • 0 to 10 V • 1 V to 5 V • 5 V to +5 V • -10 V to +10 V Output ranges, current • 0 to 20 mA • 20 mA to +20 mA • 20 mA to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • 6 for voltage output thou-wire connection • for current output, min. • vith voltage outputs, min. • vith current outputs, max. | | | |
| Type of supply voltage | Campration possible in No. | 100 | |
| Rated value (DC) | Supply voltage | | |
| permissible range, lower limit (DC) permissible range, upper limit (DC) Reverse polarity protection Yes Power consumption, max. 260 mA; with 24 V DC supply | | | |
| permissible range, upper limit (DC) Reverse polarity protection Yes Input current Current consumption, max. 260 mA; with 24 V DC supply Power Power available from the backplane bus 1.15 W Power loss Power loss, typ. 7 W Analog outputs 8 Voltage output, short-circuit protection Voltage output, short-circuit current, max. Current output, no-load voltage, max. Current output, no-load voltage, max. Cycle time (all channels), min. 0 to 10 V 9 Yes 1 to 5 V 10 to 5 V 10 to 10 V 10 to 20 mA 20 v Cutput ranges, current 0 to 20 mA 20 v Cutput ranges, current 10 to 20 mA 20 v 20 | | | |
| Pewerse polarity protection Yes | | | |
| Current consumption, max. 260 mA; with 24 V DC supply | | | |
| Current consumption, max. 260 mA; with 24 V DC supply Power loss Power loss, typ. 7 W Analog outputs 8 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 45 mA Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 125 µs; independent of number of activated channels Output ranges, voltage • 0 to 10 V Yes • 1 V to 5 V Yes • -10 V to +10 V Yes • -10 V to +10 V Yes Output ranges, current Yes • 0 to 20 mA Yes • -20 mA to +20 mA Yes • 4 mA to 20 mA Yes Connection of actuators Yes • for voltage output two-wire connection Yes • for current output two-wire connection Yes • colspan="2">Load impedance (in rated range of output) • with voltage outputs, and, connection output, smax. 1 kΩ • with voltage outputs, and | Reverse polarity protection | Yes | |
| Power available from the backplane bus 1.15 W Power loss Power loss, typ. 7 W Analog outputs Number of analog outputs Voltage output, short-circuit protection Voltage output, short-circuit current, max. 45 mA Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 125 μs; independent of number of activated channels Output ranges, voltage • 0 to 10 V • 1 V to 5 V • 10 V to 5 V • -5 V to +5 V • -10 V to +10 V Output ranges, current • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA • 4 mA to 20 mA • for voltage output two-wire connection • for voltage output two-wire connection • for voltage output two-wire connection • for current output two-wire connection • for current output two-wire connection • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, max. • with current outputs, max. | Input current | | |
| Power loss Power loss, typ. Analog outputs Number of analog outputs Voltage output, short-circuit current, max. Current output, no-load voltage, max. Cycle time (all channels), min. Output ranges, voltage • 0 to 10 V • 1 V to 5 V • -5 V to +5 V • -10 V to +10 V Output ranges, current • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA Connection of actuators • for voltage output two-wire connection • for current output two-wire connection • with voltage outputs, min. 1.15 W 7 W Analog outputs 8 Voltage output, short-circuit current, max. 45 mA 20 V 20 V Ves 125 μs; independent of number of activated channels Yes • 10 to 10 V • Yes Output ranges, voltage • 10 to 10 V • Yes Output ranges, current • 10 to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA Connection of actuators • for voltage output two-wire connection • for current output, min. • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. | Current consumption, max. | 260 mA; with 24 V DC supply | |
| Power loss Power loss, typ. Analog outputs Number of analog outputs Voltage output, short-circuit current, max. Current output, no-load voltage, max. Cycle time (all channels), min. Output ranges, voltage • 0 to 10 V • 1 V to 5 V • -5 V to +5 V • -10 V to +10 V Output ranges, current • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA Connection of actuators • for voltage output two-wire connection • for current output two-wire connection • with voltage outputs, min. 1.15 W 7 W Analog outputs 8 Voltage output, short-circuit current, max. 45 mA 20 V 20 V Ves 125 μs; independent of number of activated channels Yes • 10 to 10 V • Yes Output ranges, voltage • 10 to 10 V • Yes Output ranges, current • 10 to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA Connection of actuators • for voltage output two-wire connection • for current output, min. • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. | Power | | |
| Power loss, typ. 7 W Analog outputs 8 Number of analog outputs, short-circuit protection Yes Voltage output, short-circuit current, max. 45 mA Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 125 µs; independent of number of activated channels Output ranges, voltage Yes • 0 to 10 V Yes • 1 V to 5 V Yes • -10 V to +10 V Yes • 10 to 20 mA Yes • -20 mA to +20 mA Yes • 4 mA to 20 mA Yes Connection of actuators Yes • for voltage output two-wire connection Yes • for voltage output four-wire connection Yes • for current output two-wire connection Yes Load impedance (in rated range of output) I kΩ • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 100 nF • with current outputs, max. 500 Ω | | 1.15 W | |
| Power loss, typ. 7 W Analog outputs 8 Number of analog outputs, short-circuit protection Yes Voltage output, short-circuit current, max. 45 mA Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 125 µs; independent of number of activated channels Output ranges, voltage Yes • 0 to 10 V Yes • 1 V to 5 V Yes • -10 V to +10 V Yes • 10 to 20 mA Yes • -20 mA to +20 mA Yes • 4 mA to 20 mA Yes Connection of actuators Yes • for voltage output two-wire connection Yes • for voltage output four-wire connection Yes • for current output two-wire connection Yes Load impedance (in rated range of output) I kΩ • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 100 nF • with current outputs, max. 500 Ω | | | |
| Analog outputs 8 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 45 mA Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 125 µs; independent of number of activated channels Output ranges, voltage • 0 to 10 V • 1 V to 5 V Yes • -5 V to +5 V No • -10 V to +10 V Yes Output ranges, current Yes • 0 to 20 mA Yes • -20 mA to +20 mA Yes • 4 mA to 20 mA Yes Connection of actuators Yes • for voltage output two-wire connection Yes • for voltage output four-wire connection Yes Load impedance (in rated range of output) Yes • with voltage outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 100 nF • with current outputs, max. 500 Ω | | 7 W | |
| Number of analog outputs 8 Voltage output, short-circuit protection Yes Voltage output, short-circuit current, max. 45 mA Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 125 μs; independent of number of activated channels Output ranges, voltage Yes • 0 to 10 V Yes • 1 V to 5 V Yes • -5 V to +5 V No • -10 V to +10 V Yes Output ranges, current Yes • 0 to 20 mA Yes • -20 mA to +20 mA Yes • 4 mA to 20 mA Yes Connection of actuators Yes • for voltage output two-wire connection Yes • for voltage output four-wire connection Yes • for current output two-wire connection Yes Load impedance (in rated range of output) Yes • with voltage outputs, capacitive load, max. 100 nF • with current outputs, max. 500 Ω | i owei ioss, typ. | / vv | |
| $ \begin{tabular}{lllllllllllllllllllllllllllllllllll$ | Analog outputs | | |
| Voltage output, short-circuit current, max. Current output, no-load voltage, max. 20 V Cycle time (all channels), min. 125 μs; independent of number of activated channels Output ranges, voltage • 0 to 10 V • 1 V to 5 V • -5 V to +5 V • -10 V to +10 V Yes Output ranges, current • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA Yes Connection of actuators • for voltage output two-wire connection • for voltage output two-wire connection • for current output two-wire connection • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, max. • with current outputs, max. | Number of analog outputs | 8 | |
| Current output, no-load voltage, max. Cycle time (all channels), min. Output ranges, voltage • 0 to 10 V • 1 V to 5 V • -5 V to +5 V • -10 V to +10 V Output ranges, current • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA Connection of actuators • for voltage output two-wire connection • for voltage output tour-wire connection • for current output two-wire connection • for current output two-wire connection • with voltage outputs, min. • with voltage outputs, max. 20 V 125 μs; independent of number of activated channels 126 μs; independent of number of activated channels 127 μs; independent of number of activated channels 128 μs; independent of number of activated channels 129 μs; independ | Voltage output, short-circuit protection | Yes | |
| Cycle time (all channels), min. 125 μs; independent of number of activated channels Output ranges, voltage • 0 to 10 V • 1 V to 5 V • -5 V to +5 V • -10 V to +10 V Output ranges, current • 0 to 20 mA • -20 mA to +20 mA • -20 mA • 4 mA to 20 mA Connection of actuators • for voltage output two-wire connection • for current output two-wire connection • for current output two-wire connection • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. | Voltage output, short-circuit current, max. | 45 mA | |
| Output ranges, voltage • 0 to 10 V | Current output, no-load voltage, max. | 20 V | |
| 0 to 10 V 1 V to 5 V -5 V to +5 V No -10 V to +10 V Yes Output ranges, current 0 to 20 mA -20 mA to +20 mA 4 mA to 20 mA 4 mA to 20 mA for voltage output two-wire connection for voltage output four-wire connection for current output two-wire connection for current output two-wire connection with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. 500 Ω | Cycle time (all channels), min. | 125 µs; independent of number of activated channels | |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | Output ranges, voltage | | |
| -5 V to +5 V -10 V to +10 V Yes Output ranges, current 0 to 20 mA -20 mA to +20 mA 4 mA to 20 mA for voltage output two-wire connection for voltage output four-wire connection for current output two-wire connection with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. | • 0 to 10 V | Yes | |
| -10 V to +10 V Output ranges, current 0 to 20 mA -20 mA to +20 mA 4 mA to 20 mA for voltage output two-wire connection for voltage output four-wire connection for current output two-wire connection with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. | • 1 V to 5 V | Yes | |
| Output ranges, current • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA Yes Connection of actuators • for voltage output two-wire connection • for voltage output four-wire connection • for current output two-wire connection • the current output two-wire connection Ves Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. 500 Ω | • -5 V to +5 V | No | |
| | • -10 V to +10 V | Yes | |
| -20 mA to +20 mA 4 mA to 20 mA 7 for voltage output two-wire connection 6 for voltage output four-wire connection 7 for current output two-wire connection 8 for current output two-wire connection 9 for current output two-wire connection 1 kΩ with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. 500 Ω | Output ranges, current | | |
| 4 mA to 20 mA Connection of actuators for voltage output two-wire connection for voltage output four-wire connection for current output two-wire connection Yes for current output two-wire connection Yes Load impedance (in rated range of output) with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. 500 Ω | • 0 to 20 mA | Yes | |
| Connection of actuators • for voltage output two-wire connection • for voltage output four-wire connection • for current output two-wire connection Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. 100 nF • with current outputs, max. | • -20 mA to +20 mA | Yes | |
| | • 4 mA to 20 mA | Yes | |
| | Connection of actuators | | |
| | for voltage output two-wire connection | Yes | |
| Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. 500 Ω | • for voltage output four-wire connection | Yes | |
| • with voltage outputs, min. $1 \text{ k}\Omega$ • with voltage outputs, capacitive load, max. 100 nF • with current outputs, max. 500Ω | • for current output two-wire connection | Yes | |
| with voltage outputs, capacitive load, max. with current outputs, max. 500 Ω | | | |
| $ullet$ with current outputs, max. $500 \ \Omega$ | • with voltage outputs, min. | 1 kΩ | |
| $ullet$ with current outputs, max. 500 Ω | | 100 nF | |
| | | 500 Ω | |
| ▼ with current outputs, inductive load, max. | with current outputs, inductive load, max. | 1 mH | |
| Cable length | · | | |

| Analog value generation for the outputs | |
|--|--|
| Integration and conversion time/resolution per channel | |
| Resolution with overrange (bit including sign), max. | 16 bit |
| Conversion time (per channel) | 50 μs; independent of number of activated channels |
| Settling time | |
| for resistive load | 30 μs; see additional description in the manual |
| • for capacitive load | 100 µs; see additional description in the manual |
| • for inductive load | 100 μs; see additional description in the manual |
| Errors/accuracies | |
| 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 % |
| Operational error limit in overall temperature range | |
| Voltage, relative to output range, (+/-) | 0.3 % |
| Current, relative to output range, (+/-) | 0.3 % |
| Basic error limit (operational limit at 25 °C) | |
| Voltage, relative to output range, (+/-) | 0.2 % |
| Current, relative to output range, (+/-) | 0.2 % |
| lsochronous mode | |
| Isochronous operation (application synchronized up to terminal) | Yes |
| Execution and activation time (TCO), min. | 100 μs |
| Bus cycle time (TDP), min. | 250 μs |
| Interrupts/diagnostics/status information | |
| Diagnostics function | Yes |
| Substitute values connectable | Yes |
| Alarms | |
| Diagnostic alarm | Yes |
| Diagnostic messages | |
| Monitoring the supply voltage | Yes |
| Wire-break | Yes; Only for output type "current" |
| Short-circuit | Yes; Only for output type "voltage" |
| Overflow/underflow | Yes |
| Diagnostics indication LED | |
| • RUN LED | Yes; Green LED |

ERROR LED
 Monitoring of the supply voltage (PWR-LED)
 Channel status display
 for channel diagnostics
 for module diagnostics
 Yes; Red LED
 Yes; Red LED
 Yes; Red LED

| • for module diagnostics | Yes; Red LED |
|--|----------------------|
| Potential separation | |
| Potential separation channels | |
| • between the channels | No |
| between the channels, in groups of | 8 |
| 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 |
| | |

325 g

last modified: 08/16/2018

Weights

Weight, approx.