



SIMATIC S7-1500, analog output module AQ 4xU/I HF, 16-bit resolution accuracy 0.1%, 4 channels in groups of 1, common mode voltage: 30 V AC/60 V DC, diagnostics; substitute value, isochronous mode; the module supports the safety-oriented shutdown of load groups up to SILCL2 acc. to EN 62061:2005 + A2:2015, and Category 3 / PL d according to EN ISO 13849-1:2015. delivery including infeed element, shield bracket and shield terminal: front connector (screw terminals or push-in) to be ordered separately

General information	
Product type designation	AQ 4xU/I HF
HW functional status	From FS01
Firmware version	V1.1.0
• FW update possible	Yes
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V14 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1
• PROFINET from 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
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption, max.	160 mA; with 24 V DC supply
Power	
Power available from the backplane bus	0.95 W
Power loss	
Power loss, typ.	5 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.	22 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
• -5 V to +5 V	No
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• 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)	
• with voltage outputs, min.	1 k Ω ; 0.5 k Ω m at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 μ F
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Cable length	
• shielded, max.	800 m; for current, 200 m for voltage
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)	125 μ s; independent of number of activated channels
Settling time	
• for resistive load	0.2 ms; see additional description in the manual
• for capacitive load	1.8 ms; see additional description in the manual
• for inductive load	2 ms; 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), (+/-)	0.015 %
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), (+/-)	0.005 %
note regarding accuracy	at temperatures below 0 °C, the figures for operating error and temperature error are doubled
Operational error limit in overall temperature range	
• Voltage, relative to output range, (+/-)	± 10 V; 0 V to 10 V: $\pm 0.12\%$; 1 V to 5 V: $\pm 0.1\%$
• Current, relative to output range, (+/-)	± 20 mA; 0 mA to 20 mA: $\pm 0.2\%$; 4 mA to 20 mA: $\pm 0.12\%$
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output range, (+/-)	0.06 %
• Current, relative to output range, (+/-)	0.1 %
Isochronous mode	
Execution and activation time (TCO), min.	100 μ s
Bus cycle time (TDP), min.	250 μ s
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• 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	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED

• Channel status display • for channel diagnostics • for module diagnostics	Yes; green LED Yes; red LED Yes; red LED
Potential separation	
Potential separation channels	
• between the channels • between the channels, in groups of • between the channels and backplane bus • Between the channels and load voltage L+	Yes 1 Yes Yes
Permissible potential difference	
between different circuits	60 V DC/30 V AC; insulation rated for 120 V AC basic insulation: between the channels and the supply voltage L+; between the channels and the backplane bus; between the channels
Isolation	
Isolation tested with	2 000 V DC between the channels and the supply voltage L+; 2 000 V DC between the channels and the backplane bus; 2 000 V DC between the channels; 707 V DC (type test) between the supply voltage L+ and the backplane bus
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS03
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1 • Category according to ISO 13849-1 • SILCL according to IEC 62061	PL d Cat. 3 SILCL 2
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max.	-25 °C; From FS02 60 °C -25 °C; From FS02 40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g
last modified:	4/29/2021 