



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 SIL2 according to EN IEC 62061:2021 and Category 3 / PL d according to EN ISO 13849-1:2015. delivery including infeed element, shielding 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
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

<ul style="list-style-type: none"> • 1 V to 5 V • -5 V to +5 V • -10 V to +10 V 	Yes No Yes
Output ranges, current	
<ul style="list-style-type: none"> • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA 	Yes Yes Yes
Connection of actuators	
<ul style="list-style-type: none"> • for voltage output two-wire connection • for voltage output four-wire connection • for current output two-wire connection 	Yes Yes Yes
Load impedance (in rated range of output)	
<ul style="list-style-type: none"> • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max. 	1 k Ω ; 0.5 k Ω m at 1 to 5 V 1 μ F 750 Ω 10 mH
Cable length	
<ul style="list-style-type: none"> • shielded, max. 	800 m; for current, 200 m for voltage
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. • Conversion time (per channel) 	16 bit 125 μ s; independent of number of activated channels
Settling time	
<ul style="list-style-type: none"> • for resistive load • for capacitive load • for inductive load 	0.2 ms; see additional description in the manual 1.8 ms; see additional description in the manual 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	
<ul style="list-style-type: none"> • Voltage, relative to output range, (+/-) • Current, relative to output range, (+/-) 	± 10 V; 0 V to 10 V: $\pm 0.12\%$; 1 V to 5 V: $\pm 0.1\%$ ± 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)	
<ul style="list-style-type: none"> • Voltage, relative to output range, (+/-) • Current, relative to output range, (+/-) 	0.06 % 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	
<ul style="list-style-type: none"> • Diagnostic alarm 	Yes
Diagnoses	
<ul style="list-style-type: none"> • Monitoring the supply voltage • Wire-break • Short-circuit • Overflow/underflow 	Yes Yes; Only for output type "current" Yes; Only for output type "voltage" Yes
Diagnostics indication LED	
<ul style="list-style-type: none"> • RUN LED • ERROR LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics 	Yes; green LED Yes; red LED Yes; green LED Yes; green LED Yes; red LED Yes; red LED
Potential separation	

Potential separation channels	
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Performance level according to ISO 13849-1 • Category according to ISO 13849-1 • SIL acc. to IEC 62061 • remark on safety-oriented shutdown 	PL d Cat. 3 SIL 2 https://support.industry.siemens.com/cs/de/de/view/39198632
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> • 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:	4/27/2022 