



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
<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 kΩ; 0.5 kΩ at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	750 Ω
• 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)	125 µs; independent of number of activated channels
<b>Settling time</b>	
• 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
<b>Errors/accuracies</b>	
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
<b>Operational error limit in overall temperature range</b>	
• Voltage, relative to output range, (+/-)	±10 V; 0 V to 10 V: ±0.12%; 1 V to 5 V: ±0.1%
• Current, relative to output range, (+/-)	±20 mA; 0 mA to 20 mA: ±0.2%; 4 mA to 20 mA: ±0.12%
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to output range, (+/-)	0.06 %
• Current, relative to output range, (+/-)	0.1 %
<b>Isochronous mode</b>	
Execution and activation time (TCO), min.	100 µs
Bus cycle time (TDP), min.	250 µs
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</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
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels	Yes
• between the channels, in groups of	1
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes
<b>Permissible potential difference</b>	
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
<b>Isolation</b>	
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
<b>Standards, approvals, certificates</b>	
Suitable for safety-related tripping of standard modules	Yes; From FS03
<b>Highest safety class achievable for safety-related tripping of standard modules</b>	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-25 °C; From FS02
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; From FS02
• vertical installation, max.	40 °C
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	300 g
<b>last modified:</b>	4/29/2021 