



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; 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
<ul style="list-style-type: none"> <li>FW update possible</li> </ul>	Yes
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Prioritized startup</li> </ul>	Yes
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V14 / -
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.5 SP3 / -
<ul style="list-style-type: none"> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	V1.0 / V5.1
<ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>	V2.3 / -
Operating mode	
<ul style="list-style-type: none"> <li>Oversampling</li> </ul>	No
<ul style="list-style-type: none"> <li>MSO</li> </ul>	Yes

## CiR - Configuration in RUN

Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes

## Supply voltage

Type of supply voltage	DC
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

## Input current

Current consumption, max.	160 mA; with 24 V DC supply
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## Power

Power available from the backplane bus	0.95 W
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## Power loss

Power loss, typ.	5 W
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## 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 $\mu$ s; 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 $\Omega$ ; 0.5 k $\Omega$ 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

### 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	
<ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> </ul>	16 bit
<ul style="list-style-type: none"> <li>• Conversion time (per channel)</li> </ul>	125 µs; independent of number of activated channels
Settling time	
<ul style="list-style-type: none"> <li>• for resistive load</li> </ul>	0.2 ms; see additional description in the manual
<ul style="list-style-type: none"> <li>• for capacitive load</li> </ul>	1.8 ms; see additional description in the manual
<ul style="list-style-type: none"> <li>• for inductive load</li> </ul>	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 %
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> <li>• Voltage, relative to output range, (+/-)</li> </ul>	±10 V; 0 V to 10 V: ±0.12%; 1 V to 5 V: ±0.1%
<ul style="list-style-type: none"> <li>• Current, relative to output range, (+/-)</li> </ul>	±20 mA; 0 mA to 20 mA: ±0.2%; 4 mA to 20 mA: ±0.12%
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> <li>• Voltage, relative to output range, (+/-)</li> </ul>	0.06 %
<ul style="list-style-type: none"> <li>• Current, relative to output range, (+/-)</li> </ul>	0.1 %

## Isochronous mode

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	
<ul style="list-style-type: none"> <li>• Diagnostic alarm</li> </ul>	Yes
Diagnoses	
<ul style="list-style-type: none"> <li>• Monitoring the supply voltage</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Wire-break</li> </ul>	Yes; Only for output type "current"
<ul style="list-style-type: none"> <li>• Short-circuit</li> </ul>	Yes; Only for output type "voltage"
<ul style="list-style-type: none"> <li>• Overflow/underflow</li> </ul>	Yes
Diagnostics indication LED	
<ul style="list-style-type: none"> <li>• RUN LED</li> </ul>	Yes; green LED
<ul style="list-style-type: none"> <li>• ERROR LED</li> </ul>	Yes; red LED
<ul style="list-style-type: none"> <li>• Monitoring of the supply voltage (PWR-LED)</li> </ul>	Yes; green LED

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|---------------------------|----------------|
| • 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                     | Yes |
| • between the channels, in groups of       | 1   |
| • between the channels and backplane bus   | Yes |
| • Between the channels and load voltage L+ | 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

### Ambient conditions

#### Ambient temperature during operation

- |                                 |                   |
|---------------------------------|-------------------|
| • horizontal installation, min. | -25 °C; From FS02 |
| • horizontal installation, max. | 60 °C             |
| • vertical installation, min.   | -25 °C; From FS02 |
| • vertical installation, max.   | 40 °C             |

### Dimensions

Width	35 mm
Height	147 mm
Depth	129 mm

### Weights

Weight, approx.	300 g
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**last modified:** 09/03/2020