

SIMATIC CFU CIO HART with aluminum enclosure, bundle consisting of: 1x SIMATIC CFU CIO HART (6ES7655-5PX41-1XX0), 1x aluminum enclosure with cable glands, shield busbar, shield terminals, preassembled and checked



General information	
Product type designation	CFU CIO HART with aluminum enclosure
HW functional status	FS01
Firmware version	V1.0
• FW update possible	Yes
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0319H
Number of channels	16
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• The user can configure digital channels as input/output as required	Yes
• Digital channels can be parameterized	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 Update 2
• STEP 7 configurable/integrated from version	STEP 7 V5.7.1.4
• PCS 7 configurable/integrated from version	V9.1 SP2 UC7 (+PDM V9.3 Upd1)
• PROFIBUS from GSD version/GSD revision	- / -
• PROFINET from GSD version/GSD revision	GSDML V2.43 2024.03.04
Operating mode	
• DI	Yes
• Counter	Yes
• DQ	Yes
CIR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Installation type/mounting	
Mounting	For horizontal and vertical mounting
Mounting position	Horizontal, vertical
Recommended mounting position	horizontal set up
Supply voltage	
Type of supply voltage	24 V DC
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
Short-circuit protection	Yes
Redundant power supply	Yes
Mains buffering	
• Mains/voltage failure stored energy time	1 ms; For communication

Input current	
Current consumption (rated value)	4.1 A; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 2 A each
Current consumption, max.	9 A
Inrush current, max.	7 A
I^2t	0.5 A ² s
Encoder supply	
Number of outputs	16
Output voltage, min.	12 V
Short-circuit protection	Yes; Electronic
Output current	
<ul style="list-style-type: none"> up to 60 °C, max. 	6 A; total current DQ + additional current for analog channels
Power loss	
Power loss, typ.	6.6 W; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 12 ohms load each
Address area	
Address space per station	<ul style="list-style-type: none"> Address space per station, max.
	1 440 byte; Dependent on configuration
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Source/sink input	Yes
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Pulse extension	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Digital input functions, parameterizable	
<ul style="list-style-type: none"> Gate start/stop Freely usable digital input Counter <ul style="list-style-type: none"> Number, max. Counting frequency, max. Counting width Counting direction up/down 	<ul style="list-style-type: none"> Yes; hardware gate, usable by multiple DI counters Yes; Parameterizable input filter Yes <ul style="list-style-type: none"> 16 5 kHz; fast counter mode, sinking input; 1 kHz for sourcing input, NAMUR 32 bit Yes; Up
Input voltage	
<ul style="list-style-type: none"> Rated value (DC) for signal "0" for signal "1" permissible voltage at input, min. permissible voltage at input, max. 	<ul style="list-style-type: none"> 24 V -9 V to +5 V +11 to +30V -9 V 30 V
Input current	
<ul style="list-style-type: none"> for signal "1", typ. 	2.5 mA; max: 2.5 mA sourcing input; 2.3 mA sinking input; 10 mA fast counter; 6.5 mA NAMUR
Input delay (for rated value of input voltage)	
for standard inputs	<ul style="list-style-type: none"> parameterizable
	Yes; none / 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length	
<ul style="list-style-type: none"> shielded, max. unshielded, max. 	<ul style="list-style-type: none"> 1 000 m 600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	16
Current-sinking	No
Current-sourcing	Yes
Short-circuit protection	Yes
<ul style="list-style-type: none"> Response threshold, typ. 	4.1 A
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	typ. L+ (-11 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
<ul style="list-style-type: none"> with resistive load, max. on lamp load, max. 	<ul style="list-style-type: none"> 2 A 5 W

Load resistance range	
• lower limit	12 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	Ue minus 1 V
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	
• "0" to "1", typ.	50 μs
• "0" to "1", max.	100 μs
• "1" to "0", typ.	50 μs
• "1" to "0", max.	100 μs
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	1 Hz; at 2 A; 2 Hz at 0.5 A
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
horizontal installation	
— up to 60 °C, max.	6 A
vertical installation	
— up to 60 °C, max.	6 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	16
Input ranges (rated values), currents	
• 0 to 20 mA	Yes; 16 bit incl. sign
— Input resistance (0 to 20 mA)	233 Ω
• 4 mA to 20 mA	Yes; 16 bit incl. sign
— Input resistance (4 mA to 20 mA)	233 Ω
HART communication	
• Primary Master	Yes
• input resistance (with HART communication)	233 Ω
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Analog outputs	
Number of analog outputs	16; short-circuit proof with respect to ground
Current output, no-load voltage, max.	24 V
Output ranges, current	
• 0 to 20 mA	Yes; 15 bit
• -20 mA to +20 mA	No
• 4 mA to 20 mA	Yes; 16 bit incl. sign
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• for current outputs, min.	50 Ω
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs	36 V; Minus 0.3 V lower limit
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m

Analog value generation for the inputs	
Measurement principle	integrating (Sigma-Delta)
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. Integration time, parameterizable 	16 bit Yes; channel by channel
Smoothing of measured values	
<ul style="list-style-type: none"> parameterizable 	Yes; none, weak, medium, strong, channel-by-channel
Analog value generation for the outputs	
Settling time	
<ul style="list-style-type: none"> for resistive load for inductive load 	2 ms; 750 ohm 1.2 ms
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> for current measurement as 2-wire transducer 	Yes
Connectable encoders	
<ul style="list-style-type: none"> NAMUR encoder/changeover contact according to EN 60947 2-wire sensor — permissible quiescent current (2-wire sensor), max. 	Yes; no CO contact Yes 1.5 mA
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.05 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	0.003 %/K
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.02 %
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> Current, relative to input range, (+/-) Current, relative to output range, (+/-) 	0.5 % 0.5 %; 0 ... 60 °C: 0.2 %
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> Current, relative to input range, (+/-) Current, relative to output range, (+/-) 	0.1 % 0.1 %
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET
Isolated	Yes
Interface types	
<ul style="list-style-type: none"> Number of ports integrated switch BusAdapter (PROFINET) 	2; via BusAdapter Yes Yes
Protocols	
<ul style="list-style-type: none"> PROFINET IO Device Media redundancy 	Yes Yes; as MRP client
Interface types	
RJ 45 (Ethernet)	
<ul style="list-style-type: none"> 100 Mbps Autonegotiation Autocrossing 	Yes Yes Yes
Protocols	
Supports protocol for PROFINET IO	Yes
HART protocol	Yes
<ul style="list-style-type: none"> Protocol version 	up to Revision 7
PROFINET IO Device	
Services	
<ul style="list-style-type: none"> Shared device 	No
Redundancy mode	

• PROFINET system redundancy (S2)	Yes
Media redundancy	
— MRP	Yes
Open IE communication	
• LLDP	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Limit value alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green/red LED
• Channel status display	Yes; green/red LED
• Status indicator digital input (green)	Yes
• Status indicator digital output (green)	Yes
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter
Integrated Functions	
Frequency measurement	Yes
• Number of frequency meters	16
Counting functions	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
Measuring functions	
• Dynamic measurement period adjustment	Yes
Measuring range	
— Frequency measurement, min.	0.1 Hz
— Frequency measurement, max.	25 kHz; fast counter mode, sinking input; 1 kHz sourcing input, NAMUR
Accuracy	
— Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation digital inputs	
• between the channels	No
• between the channels and the power supply of the electronics	No
Potential separation digital outputs	
• between the channels	No
• between the channels and the power supply of the electronics	No
Isolation	
Isolation tested with	1 500 V AC between PROFINET and other electronics
Degree and class of protection	
IP degree of protection	IP66
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C

• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C; Observe derating
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %
connection method	
Design of electrical connection	Connection plug
Dimensions	
Width	414 mm
Height	266 mm
Depth	111 mm
Weights	
Weight, approx.	5.5 kg
Classifications	

	Version	Classification
eClass	14	27-24-26-90
eClass	12	27-24-26-90
eClass	9.1	27-24-26-90
eClass	9	27-24-26-90
eClass	8	27-24-92-90
eClass	7.1	27-24-92-90
eClass	6	27-24-92-90
ETIM	10	EC002584
ETIM	9	EC002584
ETIM	8	EC002584
ETIM	7	EC002584

Approvals / Certificates

General Product Approval	EMV	For use in hazardous locations
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[Type Examination Certificate](#)

For use in hazardous locations	Environment
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last modified:

10/23/2025