

HART 4 Devices

Datasheet

A-HRT-4I

A-HRT-4O

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1. PREFACE

1.1. ABOUT THIS DOCUMENT

This document contains the technical data for the HART 4In and HART 4Out modules. The HART 4 module can convert up to four analog devices into either EtherNet/IP, Modbus-TCP, or DNP3 TCP/UDP protocols. This includes 4 to 20 mA input and output devices with or without HART communications as well as 0 to 20 ma devices without HART.

1.2. FEATURES

The Hart 4 is available in Input or Output variations:

- 1) **A-HRT-4I** for HART input devices like process instruments.
- 2) **A-HRT-4O** for HART output devices like valve positioners.

The conversion to EtherNet/IP enables a HART device to be added directly into a Rockwell Automation Logix IO tree. The Modbus-TCP option enables a HART field device to be viewed as a Modbus Slave. The DNP3 option converts a HART field device into a DNP3 Outstation. The DNP3 option, also supports Secure Authentication, ensuring secure communications across the Ethernet network.

In addition, a rich collection of process and diagnostic information is provided directly into Logix, without the use of any explicit messaging. HART commands can also be relayed to the device using an EtherNet/IP message relay object. A DTM (Device Type Manager) is available further simplifying device configuration and management using an FDT frame. A built-in webserver provides detailed diagnostics of system configuration and operation as well as field device specific diagnostics.

The Hart 4 module is configured using the Aparian Slate application. This program can be downloaded from www.aparian.com free of charge.

1.3. INSTALLATION

The figure below provides an example of the typical installation.



Figure 1 - Example of a typical installation

The module has six ports at the bottom of the enclosure as shown in the figure below. The ports are used for Ethernet, the four analog HART channels and power. The power port uses a three-way connector which is used for the DC power supply and the earth connection.

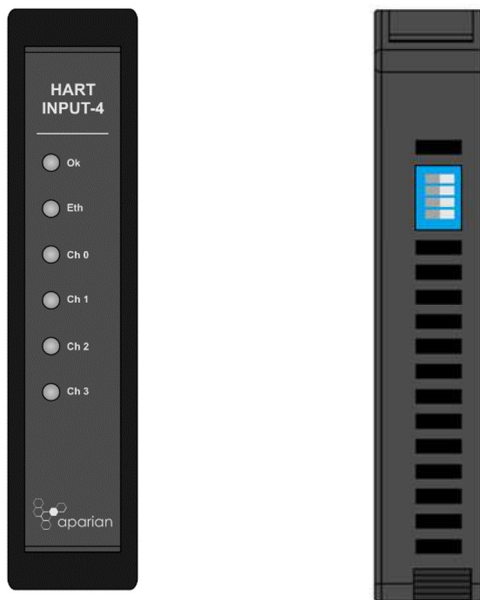


Figure 1 – HART 4 (Input) front and top view

The module provides six diagnostic LEDs as shown in the front view figure below. These LEDs are used to provide information regarding the module system operation, the Ethernet interface, and the status of each of the four analog HART channels.

2. TECHNICAL SPECIFICATIONS

2.1. ETHERNET

Specification	Rating
Connector	RJ45
Conductors	CAT5 STP/UTP
ARP connections	Max 20
TCP connections	Max 20
CIP connections	Max 10
Communication rate	10/100Mbps
Duplex mode	Full / Half
Auto-MDIX support	Yes

Table 1 - Ethernet specification

2.2. ANALOG INPUT CHANNEL (HART 4 IN)

Specification	Rating
Number of channels	4
ADC resolution	12 bit
Input impedance	247.5 Ω
Accuracy (calibrated 25°C)	< 0.15 %
Accuracy (uncalibrated)	< 0.30 %
Range	0 – 22 mA
Current limit	34 mA

Table 2 - Analog Input channel specification

2.3. ANALOG OUTPUT CHANNEL (HART 4 OUT)

Specification	Rating
Number of channels	4

DAC resolution	16 bit
Drive	50 – 1170 Ω Resistive < 50 mH Inductive
Accuracy (calibrated 25°C)	< 0.15 %
Accuracy (uncalibrated)	< 0.30 %
Range	0 – 22 mA

Table 3 - Analog Output channel specification

2.4. ELECTRICAL

Specification	Rating
Power requirements	Input: 12 – 28V DC, 35mA @ 24 VDC – With no field devices attached. 130mA @ 24 VDC - With 4 field devices at 22mA each. 64mA @12 VDC - With no field devices attached. 160mA @ 12 VDC - With 4 field devices at 22mA each.
Power consumption	0.9 W – With no field devices attached. 3.1 W – With 4 field devices at 22mA each. 4.3 W – With input channels shorted. (HART 4In)
Connector (Power)	3-way terminal
Connector (Analog)	2-way terminal
Conductors	24 – 18 AWG
Enclosure rating	IP20, NEMA/UL Open Type
Temperature	-20 – 70 °C
Earth connection	Yes, terminal based
Emissions	IEC61000-6-4
ESD Immunity	EN 61000-4-2
Radiated RF Immunity	IEC 61000-4-3
EFT/B Immunity	EFT: IEC 61000-4-4
Surge Immunity	Surge: IEC 61000-4-5

Table 1 - Electrical specification

2.5. CERTIFICATIONS



Certification	Mark
CE Mark	
RoHS2 Compliant	RoHS2
ODVA Conformance	EtherNet/IP™ <small>* F/W 1.004</small>
RCM	

Table 5 – Certifications

2.6. DIMENSIONS

Below are the enclosure dimensions as well as the required DIN rail dimensions. All dimensions are in millimetres.

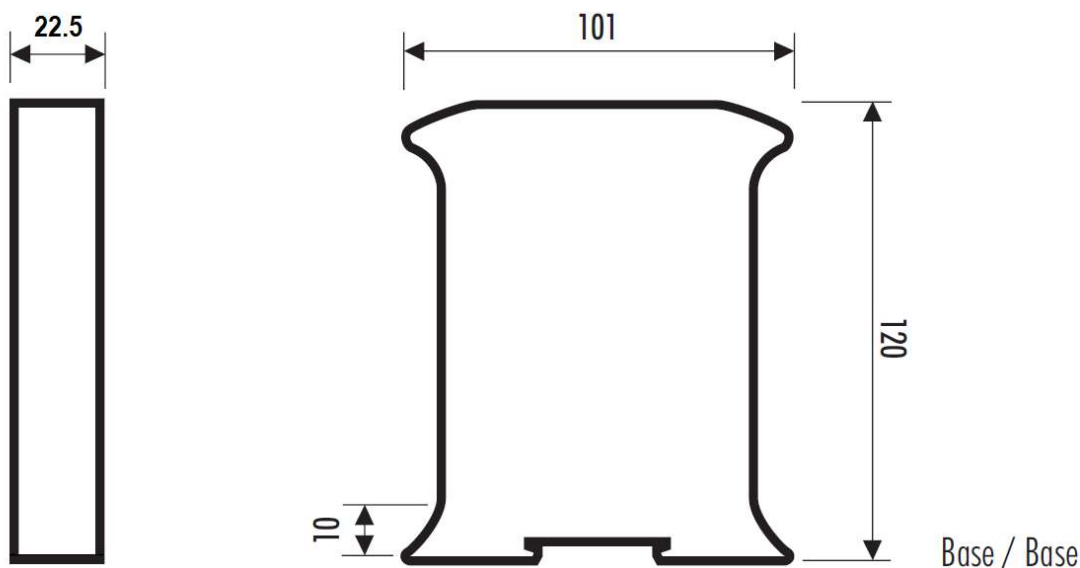


Figure 3 – HART 4 module enclosure dimensions

