



## Embedded I/O Datasheet

**HART Technologies' Microprocessor and I/O boards are designed to meet the rigorous performance requirements of industrial, defense and aviation customers.** Our Embedded I/O Chassis Modules and PC104 form factor products deliver high data rate input/output over a wide range of thermal and vibration profiles. All intelligent boards include our user modifiable code base to streamline customization to meet your unique embedded I/O requirements.

### • HT015010000 – Chassis with I/O Backplane

- 5U Base Embedded I/O Chassis
- Fits standard 19" Rackmount or optional ruggedized standalone format
- 8 I/O Module Slots with dedicated rear mounted external connectors
  - 55 Pin MIL-38999 (17/E Size) with 50 input/output or 25 differentially routed pairs
    - Mate: D389999/26WE35PN
  - 37 Pin MIL-38999 (15/D Size) with USB, Ethernet, Serial outputs
    - Mate: D389999/26WD35PN
  - Dedicated Power Slot with intelligent communication bus
    - 16 Pin MIL-38999 power in connector
      - Power In (2 pins / 13 amp)
      - Four Relay Input Pairs (2 pins ea.)
      - Mate: D38999/26WG16SN
    - 16 Pin MIL-38999 Relay out connector
      - Four Relay Output Pairs (2 pins ea. / 7.5 amps)
      - Mate: D38999/26WG16PN
  - Configurable SPI busing
  - Hour Meter
- Operating temperature range -30/+65C

### • HT015030001 – Quad Channel Fiber Module

- Module for Embedded I/O Chassis
- 32 Bit ATMEL Processor
- Onboard interfaces
  - 4 Channel Fiber
    - TX / RX
    - ST Connector
    - 820nm wavelength
  - 2 SPI / TWI
  - 2 CAN Bus A/B
  - 1 USB Interface
  - 1 100BaseT Ethernet
  - 1 Ethernet LED Control
- Onboard I/O
  - 8 Opto-isolated discrete inputs
  - 8 Opto-isolated solid-state relays
  - 8 Channel single A/D convertor
- Board ID: 2 bits external strapping with 16 position internal selector
- 5v power input; 12 - 32v input optional for relay output
- Operating temperature range -30/+65C
- User modifiable code base via JTAG (IEE1149.1 Compliant)

### • HT013100001 - Main Processor Board

- Requires Carrier Card for Chassis installation
- 32 Bit ATMEL Processor
  - Onboard interfaces
    - 2 configurable RS232/RS422/RS484/SSI ports
    - 1 RS422/RX485 / 2 SPI / 2 TWI
    - 2 CAN Bus A/B
    - 1 USB Interface
    - 1 100BaseT Ethernet
- Onboard I/O
  - 8 Opto-isolated discrete inputs; 2.3v trigger (standard), 9v trigger (-01), Analog Input (-02)
  - 8 Opto-isolated solid-state relays

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- 8 Channel single A/D convertor
  - 5v power input; 12v or 24v input optional for relay outputs
  - Operating temperature range -30/+65C
  - User modifiable code base via JTAG (IEE1149.1 Compliant)
- ### • HT015030003B – Dual Channel Fiber Module
- Requires Carrier Card for Chassis installation
  - 32 Bit ATMEL Processor
  - Onboard interfaces
    - 2 Channel Fiber
      - TX / RX
      - ST Connector
      - 820nm wavelength
    - 2 configurable RS232/RS422/RS485
    - 2 SPI / TWI
    - 2 CAN Bus A/B
    - 1 USB Interface
    - 1 100BaseT Ethernet
    - 1 Ethernet LED Control
  - Onboard I/O
    - 4 Opto-isolated discrete inputs
    - 4 Opto-isolated solid-state relays
    - 2 Channel single A/D convertor
  - Board ID: 2 bits external strapping with 16 position internal selector
  - 5v power input; 12 - 32v input optional for relay output
  - Operating temperature range -30/+65C
  - User modifiable code base via JTAG (IEE1149.1 Compliant)
- ### • HT016100170 – E70 Main Processor Board
- Requires Carrier Card for Chassis installation
  - 32 Bit Cortex-M7 processor, 300MHz, 64bit FPU
  - Onboard interfaces
    - 2 configurable RS232/RS422/RS484/SSI ports
    - 1 RS422/RX485 / 1 SPI / 1 TWI
    - 1 CAN Bus A/B
    - 1 USB Interface
    - 1 100BaseT Ethernet
  - Onboard I/O
    - 8 Opto-isolated discrete inputs; 2.3v trigger (standard)
    - 8x Optically isolated solid-state relays for discrete output, 8x jumper select 28v or GND
    - 8 Channel single A/D convertor
  - 5v power input; 12v or 24v input optional for relay outputs
  - Operating temperature range -30/+65C
  - User modifiable code base via JTAG (IEE1149.1 Compliant)
- ### • HT001100001 - General Purpose I/O Card (GPIO)
- Requires Carrier Card for Chassis installation
  - XMega 8 bit processor
    - Interface: SIP, I2C, JTAG and RS232 debug
    - External sample rate up to 2Khz with all channels active
  - 4 configurable RS232/485/422 Serial Ports
  - 2 dedicated RS422 Ports
  - 16 Opto-isolated Inputs; 2.3v trigger (standard), 9v trigger (-01), Analog Input (-02)
  - 16 Opto-isolated 1A polyfused Outputs configurable to sourced input (5v, 24, gnd)
  - Operating temperature range -30/+65C
  - User modifiable code base via JTAG (IEE1149.1 Compliant)
- ### • HT001100002 - Analog to Digital I/O Card (ADC)
- Requires Carrier Card for Chassis installation
  - XMega 8 bit processor
    - Interface: SIP, I2C, JTAG and RS232 debug

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- External sample rate up to 2Khz with all channels active
  - Two banks of two bipolar 16 single ended / 8 differential inputs
    - +/-30v input, up to 30kSPS sample rate
  - Operating temperature range -30/+65C
  - User modifiable code base via JTAG (IEE1149.1 Compliant)
- HT001100003 - Digital to Analog I/O Card (DAC)**
    - Requires Carrier Card for Chassis installation
    - XMega 8 bit processor
      - Interfaces: SIP, I2C, JTAG and RS232 debug
      - External sample rate up to 2Khz with all channels active
    - Bipolar 16 channels / 16 bit analog outputs configuration with up to 4 fully differential outputs
      - +/-10v output
      - Output channels can be individually or simultaneously controlled
      - Output update rate up to 1Khz with all channels active
    - Operating temperature range -30/+65C
    - User modifiable code base via JTAG (IEE1149.1 Compliant)

- HT001100004 - Synchro Resolver Board (SYN/RES)**
  - Requires Carrier Card for Chassis installation
  - XMega 8 bit processor
    - Interfaces: SIP, I2C, JTAG and RS232 debug
    - External output rate up to 2Khz
  - Sin/Cos Resolver Emulator
    - Single channel / Differential out
    - Buffered Reference Output
    - Reference Input Range: 40Hz - 10K Hz
  - 2 dedicated RS422 Ports
  - Operating temperature range -30/+65C
  - User modifiable code base via JTAG (IEE1149.1 Compliant)

- HT015030010 – Redundant Power Module**
  - Module for Embedded I/O Chassis
  - Control Logic
    - Redundant output power with automated failover based on health of module
    - Dedicated current and Voltage sensors for each module
    - Status lights for each module
    - 2 Opto-isolated Power status I/O line outputs
  - Input Power
    - 18-36VDC (with 12 VDC/15 VDC modules)
    - Protected by 3A circuit breaker
  - Output Power
    - 18-28VDC (unregulated input voltage)
    - +5 VDC @ 6A
    - +/-15 VDC @ 3A expansion modules installed
  - 8 Bit Atmel Processor
  - 4 Solid-State Relays
    - Controlled by Main or GPIO Module
    - 7.5A each – protected by circuit breakers
  - Onboard interfaces
    - SPI
    - TWI
  - User modifiable code base via JTAG
  - Operating temperature range -30/+65C

- HT001100005 - I/O Expander/Breakout Board**
  - For use with Embedded I/O Chassis
  - 50 channel screw terminal
  - 5 mechanical DPDT relays (50v) with NC, NO, Common terminal
  - Operating temperature range -30/+65C

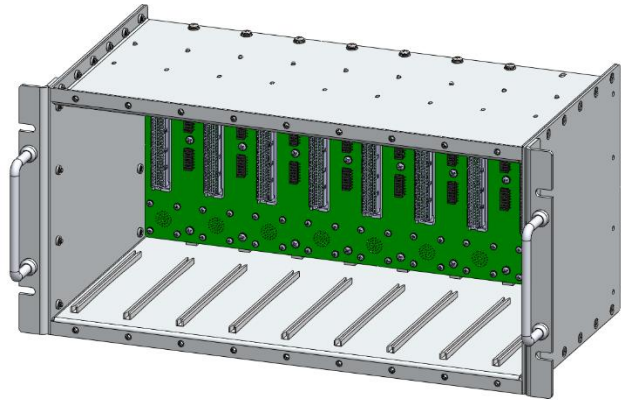
- HT022100000 - Description: 10 Port 10/100 Network Switch**
  - Onboard interfaces
    - # 10 - 4 pin 10/100 Ethernet Connectors
    - # 2 - expansion connectors for interfacing to additional switches

- 3.6v-36v power input
- Operating temperature range -30/+65C
- Ability to daisy chain multiple switches to increase number of available ports

Detailed schematics available after purchase upon request\*\*

\* Available on GSA Schedule 70 Contract No. GS-35F-0349T

\*\* Upon execution of Technical Data License Agreement



Chassis w/Backplane - HT015010000



Chassis with Modules Installed – RG Configuration



Quad Channel Fiber Module - HT015030001