

Additional Features

- **Batch processing.** The Harmony rack controller provides batch control through either Batch function codes or the high-level Batch programming language (Batch 90). Features include data storage (timers, counters, etc.) and recipe storage in on-board nonvolatile memory (NVM). The NVM provides for automatic saving and restoration of information and configuration on power failure.
- **Eight execution segments.** Eight segments that run at different cycle times are available. Assign higher priority function blocks (safety interlock logic) to segments with very fast scan times. Assign lower priority (advanced control algorithms) to segments with slower scan times.
- **Foreign device interface.** The Harmony rack controller has two on-board RS-232-C serial ports. These allow you to interface the Harmony rack controller to foreign devices such as PLCs. Protocol conversion is through Basic or C in the Harmony rack controller. The ports are optically isolated to prevent ground loops and potential equipment damage.
- **I/O types.** The controller uses analog/digital modules for I/O. It supports a wide variety of field I/O signals without external signal converters. These signals include low and high level analog, TC, RTD, pulse, frequency, digital and ABB smart transmitters.

Description

The Harmony rack controllers refer to a series of three controllers differentiated by their configuration memory capacity, execution speed and I/O support. The Harmony Bridge Controller (BRC-100/200) can support block and rack I/O simultaneously. The Harmony Multifunction Processors (IMMFP11 and IMMFP12) support only rack I/O.

Each controller occupies a single slot in the module mounting unit. It consists of a single-board module that plugs into the module mounting unit. In the case of the Harmony Bridge Controller, a Process Bus Adapter card is connected at the rear of the module to provide cable connections to the Harmony I/O subsystem and termination unit. As is standard, the module mounting unit provides built-in connections for rack modules.

The Harmony rack controllers use a powerful 32-bit processor. On-board nonvolatile storage is provided for the control algorithms and user configurations. LEDs on the module front-plate display error messages and diagnostic data. One red/green LED displays module operating status.

Operation

The Harmony rack controller receives process I/O from a variety of sources such as Harmony block or rack I/O modules, or both for the Harmony bridge controller. Additionally, data within the controller may be imported or exported to Cnet.

An extensive library of 200 function codes and user-defined functions, that include Ladder, Batch 90, Expert 90, C and Basic languages, gives users the tools needed to design complex control strategies to fit any control application. The control strategy is stored in NVRAM. If system power should be lost for any reason, the control strategy is retained until power is restored.

In a redundant controller configuration, if the primary controller fails, the secondary is waiting in standby with the same control strategy and current process data, and assumes control immediately. Diagnostic routines are constantly checking the integrity of the module hardware and

firmware. The operator can monitor module status through the LEDs on the module front-panel or view module status reports on operator consoles or stations.

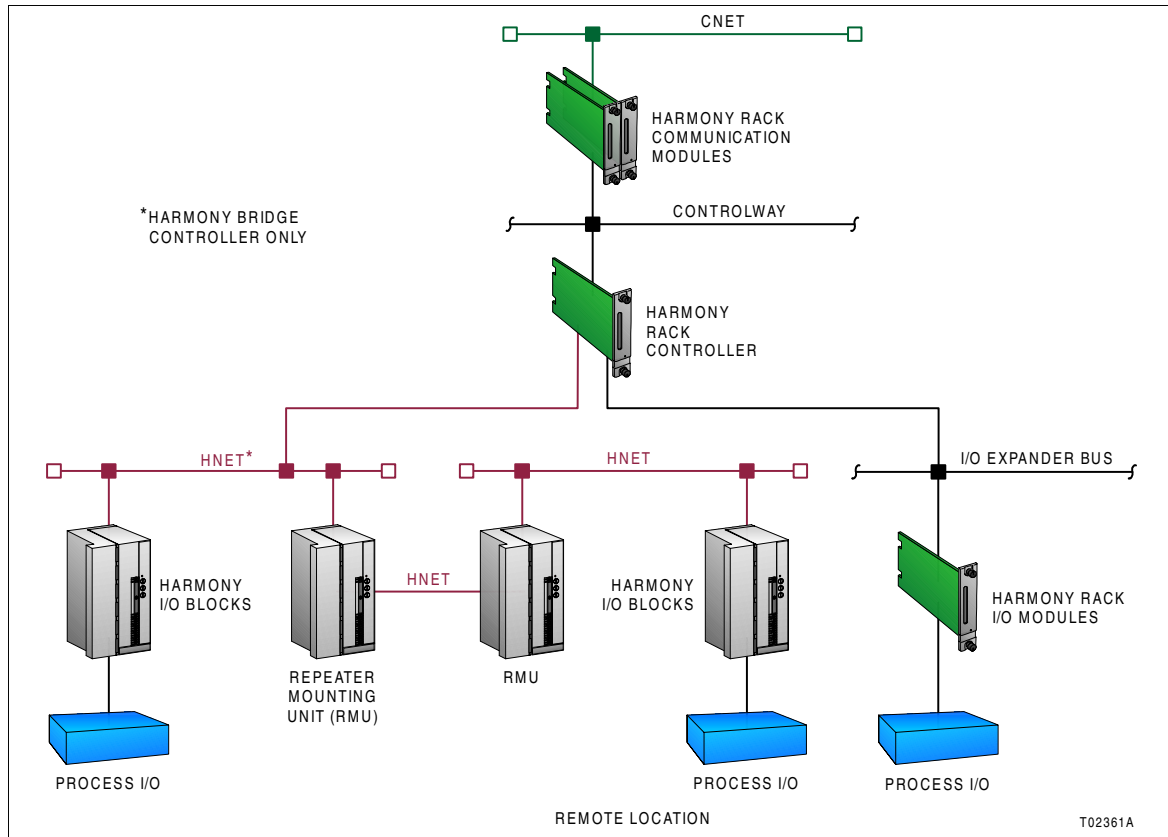


Figure 1. Harmony Rack Multifunction Controller Architecture

Related Hardware

Hardware	Nomenclature	Description
Analog input	IMASI13	15 analog inputs: 1-5 VDC, 0-1 VDC, 0-5 VDC, 0-10 VDC, 4-20 mA, smart transmitter (BC, EQ) ± 10 VDC
Analog output	IMASO11	14 analog outputs: 1-5 VDC, 4-20 mA
Control I/O	IMCIS12	4 analog inputs: 1-5 VDC, 4-20 mA 3 digital inputs: 24 VDC, 125 VDC, 120 VAC 4 digital outputs: 24 VDC, 250 mA 2 analog outputs: 1-5 VDC, 4-20 mA
Digital input	IMDSI12	16 digital inputs: 24 VDC, 125 VDC, 120 VAC
Digital Input	IMDSI13	16 digital inputs: 24 VDC
Digital input	IMDSI14	16 digital inputs: 48 VDC,
Digital input	IMDSI15	16 digital inputs: 125 VDC, 120 VAC
Pulse input	IMDSM04	8 pulse inputs: 0-50 kHz, 4-6 VDC, 21.6-27 VDC
Digital output	IMDSO14	16 digital outputs: 24 VDC or 48 VDC
Digital output	IMDSO15	8 digital outputs: 48 VDC or 120 VAC
Frequency counter	IMFCS01	1 magnetic pickup input (turbine controls)
Hydraulic servo	IMHSS03	1 servo coil output (turbine controls)
Quick response	IMQRS12	Same I/O as IMCIS12 (12 times/second scan)