

Features and Benefits

- **System connectivity:** Provides a high-speed client/server interface to Conductor human system interfaces, Composer™ tools, and Performer applications via Ethernet™ TCP/IP.
- **Easy system information access:** Provides easy data exchange between control system and supervisory management systems via semAPI.
- **Third-party device interface:** Provides direct link to third-party devices through the use of standard software drivers.
- **Downloadable firmware:** Downloaded via the network to take advantage of future system enhancements, thereby reducing life cycle costs.
- **Compatible with existing systems:** Can be added to existing INFI-NET® communications network and provide semAPI client/server connectivity.
- **Local interface:** LCD display indicates module type, displays menus, and provides operational feedback.



The Harmony Network Communications Coupler serves as a gateway between the Control Network (Cnet) and the Operations Network (Onet) of the Symphony™ Enterprise Management and Control System. It is a real-time data server that provides high-speed, high volume, bidirectional data access for single or multiple client applications.

For Cnet network access the coupler can be configured to interface one specific Onet (i.e., Ethernet TCP/IP) device or a small network of devices. These devices include Conductor human system interfaces, Composer tools platforms, and Performer applications platforms. Additionally, the coupler can interface third-party applications using semAPI, a high performance software interface. The primary functions of the coupler are to allow an Onet device to tune Harmony controllers, monitor process and system data, and perform process control.

The coupler operates as a Cnet-to-computer communications interface and is compatible with the INFI 90® OPEN Strategic Enterprise Management System and the INFI-NET communication network.

Description

The Harmony network communications coupler is an integrated package that combines computer interface, communication, and power supply functions into one user-replaceable module. It consists of a coupler module mounted on a docking station with termination units (Fig. 1). It contains printed circuit boards that provide processor and network communication interfaces. The docking station provides system power and termination unit connections to Cnet and Onet networks.

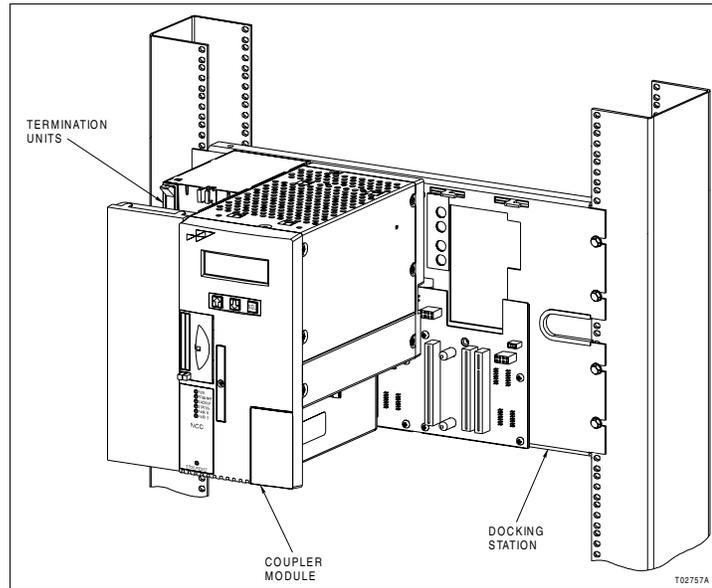


Figure 1. Harmony Network Communications Coupler

The coupler incorporates a 64-bit microprocessor running at 100 megahertz. The resident operating system VxWorks[®] is a POSIX compliant, multitasking, interrupt driven, real-time operating system. The CPU interprets and executes instructions to provide computer interface, control communication, run diagnostics, and report status. The memory system consisting of flash-ROM memory and DRAM memory has built-in, automatic error detection and correction features to sustain system reliability and availability. Firmware is downloadable via the Onet or Cnet network minimizing overall life-cycle support costs.

The docking station provides termination and distribution of signals, and the means to mount the coupler module. It contains a printed circuit board backplane which contains circuitry, and the physical communication pathways, and the power distribution signal lines between the coupler module and the termination unit. External cable connections attach at the termination unit. Backplane circuitry stores coupler setup information including its loop and node addresses, loop mode, licenses, and setup options. This allows replacing a coupler module and having the replacement module automatically retrieve and update its setup and license information.

Operation

The Harmony network communications coupler provides real-time information from the Cnet network to applications on the Onet network (Fig. 2). It also distributes data and commands from these applications to their destinations in the Harmony control units.

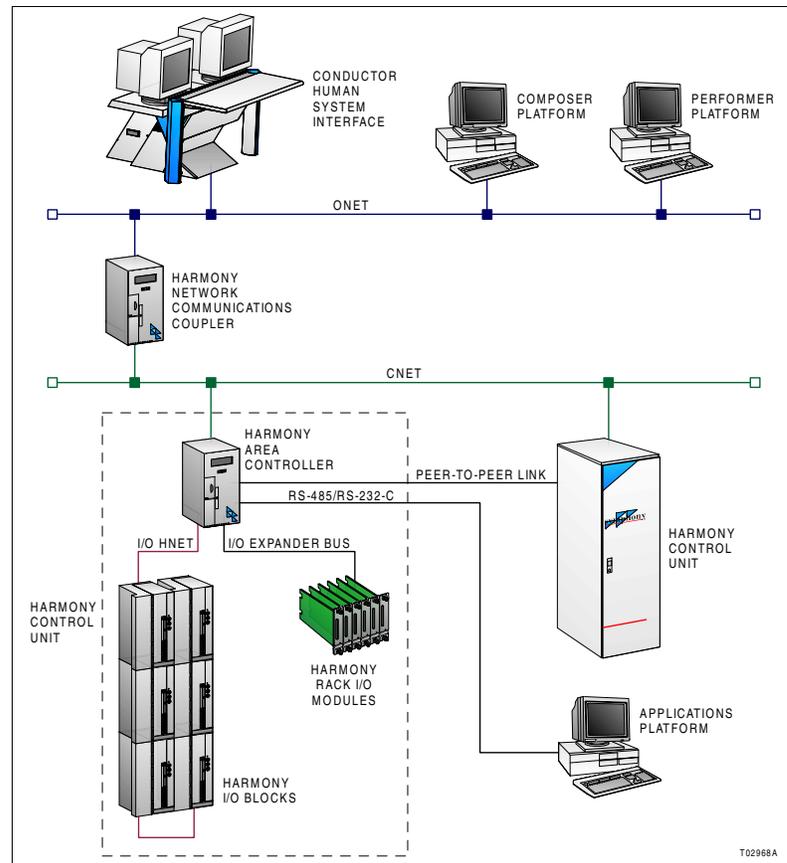


Figure 2. Harmony Communications Architecture

Human System Interface

A human system interface such as a workstation running Conductor NT software is a high-level supervisory control computer that monitors and controls plant operations from a single point. It connects to Cnet through the coupler. The Cnet connection gives plant personnel access to dynamic plant-wide process information. Personnel can monitor, tune, and control an entire plant process from workstation color-graphics displays and a keyboard. The number of workstations in a Symphony system varies and depends on the overall control plan and size of a plant. Typically, each stand-alone or server Conductor NT workstation has a dedicated coupler.

Composer Platform

A computer running Composer software connects to Cnet through the coupler. The computer connection to Cnet enables plant personnel to develop and maintain control configurations (i.e., function blocks), manage the system database, and create HSI displays and logs remotely using Composer engineering tools. A Composer platform can interface to Cnet through a dedicated coupler or several can simultaneously share a single coupler.

Performer Platform

The coupler can operate as a data server to multiple Performer application interface clients such as Gensym[®] G2[®] interface, InfoPlus.21[™] interface, SAP[®] Link, etc. Data exchanges between the coupler and client applications are made through an embedded semAPI server. SemAPI is a high

performance, standardized, distributed client/server software product used to create application programs that can read and write process control data from and to the Symphony system.

The coupler provides semAPI applications access to Harmony devices through its Cnet network interface. Within the semAPI software, calls are integrated with computer software applications to establish communication and to perform various control and data acquisition functions.

Multiple client applications residing on different host computers operate independently of each other and can access the coupler simultaneously. The coupler supports up to 10 simultaneous semAPI client connections. Conversely, multiple couplers can communicate with a single client application on the host computer.

Operations Network

The coupler is a node on the Onet network. Onet is IEEE[®] 803.2 Ethernet compliant, supports TCP/IP communication protocol, and operates at 10-Mbps. Onet supports 10Base2 (thin coaxial), 10Base5 (thick coaxial), 10BaseT (category 5 twisted-pair), and 10BaseFL (fiber optic) cable. Standard Ethernet equipment and network topologies can be used in constructing the Onet network.

Control Network

The coupler is a node on the Cnet network. Cnet is a unidirectional, high-speed serial data network that operates at a 10-megahertz communication rate. It supports a central network with up to 250 node connections. Multiple satellite Cnet networks can link to the central network. Each satellite network supports up to 250 node connections. Interfacing a maximum number of satellite networks gives a system capacity of 62,500 nodes. A node can be a satellite network, a Harmony control unit consisting of a Harmony area controller with its I/O devices, and a Harmony network communications coupler connecting human system interfaces and computers operating on the Onet network.

Data is transferred in messages that contain system data, control, and configuration information and also in exception reports. Exception reported data appears as dynamic values, alarms, and state changes on displays and in reports generated by human system interfaces and other system nodes.

Compatibility

The Harmony network communications coupler is compatible with existing INFI 90 OPEN systems. The coupler can easily be integrated into established installations that currently use INFI-NET communications and semAPI client/server applications.

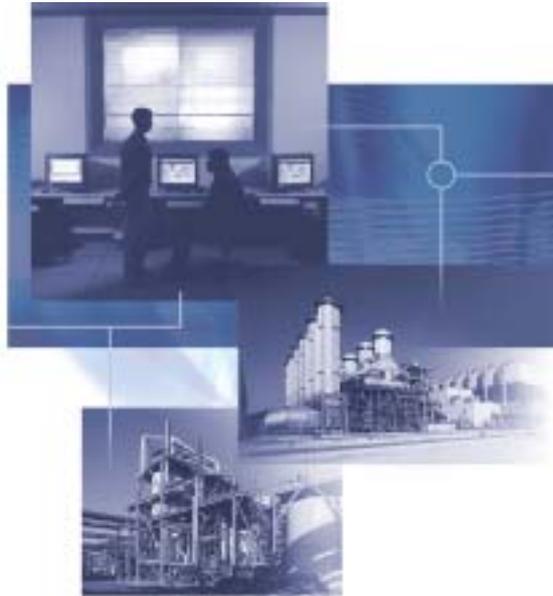
Software Licenses

The Harmony network communications coupler utilizes software licensing to manage its major available functions. A software key is necessary for proper operation of specific functions. The following functions are under license management control:

- Number of tags (10,000 or 30,000).
- Number of clients (1, 5, or 10).

- TM Ethernet is a trademark of Xerox Corporation.
- ® G2 and Gensym are registered trademarks of Gensym Corporation.
- TM InfoPlus.21 is a trademark of Aspen Technology, Inc.
- ® VxWorks is a registered trademark of Wind River Systems, Inc.
- TM Symphony, Control ^{IT}, and Composer are trademarks of ABB.
- ® INFI-NET and INFI 90 are registered trademarks of ABB.
- ® SAP is a registered trademark of SAP AG.
- ® IEEE is a registered trademark of Institute of Electrical and Electronic Engineers, Inc.

*For more information on the Control^{IT} suite of products, contact us at ControlIT@us.abb.com
For the latest information on ABB visit us on the World Wide Web at <http://www.abb.com/control>*



**For additional information,
visit us on the Internet at www.abb.com/controlsystems**



ABB Inc.
29801 Euclid Avenue
Wickliffe, Ohio 44092
Phone: +1 440 585-8500
Fax: +1 440 585 8756
www.abb.com/controlsystems

ABB AB
SE-721 59 Västerås, Sweden
Phone: +46 (0) 21 34 2000
Fax: +46 (0) 21 13 78 45
www.abb.com/controlsystems

ABB GmbH
Dudenstraße 44-46, D-68167
Mannheim, Germany
Phone: +49 (0) 1805 266 776
Fax: +49 (0) 1805 776 329
www.abb.com/controlsystems

Copyright © 2003 by ABB Inc. All rights to trademarks reside with their respective owners.

Specifications subject to change without notice. Pictures, schematics and other graphics contained herein are published for illustration purposes only and do not represent product configurations or functionality. User documentation accompanying the product is the exclusive source for functionality descriptions.