Description

Harmony sequence of events (SOE) provides distributed event monitoring, recording, and reporting capabilities for the Symphony™ Enterprise Management and Control System. An SOE event is a transition of a digital signal from either on to off or from off to on. A series of SOE modules collect and time-stamp these digital transition events which are then made available to the system. Figure 1 shows the distributed sequence of events system architecture.

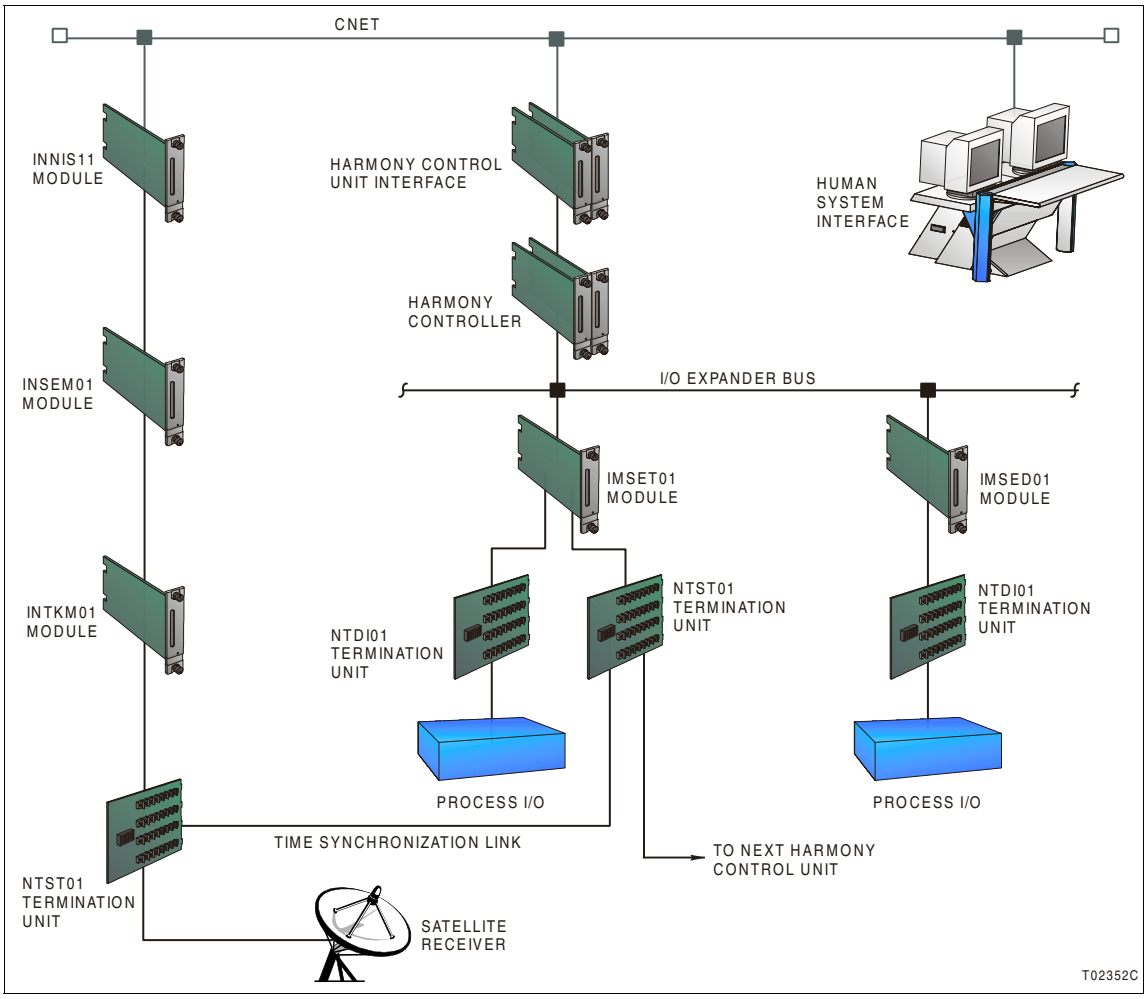

Figure 1. Distributed Sequence of Events System Architecture

An SOE module consists of a single printed circuit board that occupies one slot in a module mounting unit (MMU). In general, jumpers and switches on the printed circuit board and jumpers and dispshunts on the termination unit configure the module and its I/O channels. A cable connects the SOE module to its termination unit. The physical connection points for field wiring are on the termination unit.

Server Node

The INSOE01 Server Node consists of the INNIS11 Network Interface module, the INSEM01 Sequence of Events Master module, and the INTKM01 Time Keeper Master module.

INSEM01

The INSEM01 Sequence of Events Master module communicates with the INNIS11 Network Interface module and the INTKM01 Time Keeper Master module. The INNIS11 module is the front end for all Cnet (control network) communication interfaces and is the intelligent link between a node and Cnet. The INSEM01 module communicates directly with the INNIS11 module. The INSEM01 module is responsible for managing the distributed sequence of events system, which includes managing:

- 1,500 points coming from the SOE I/O modules in up to 1,000 Harmony control units (HCU).
- 256 complex triggers with 16 operands each.
- 3,000 simple triggers.

The INSEM01 module is configured using the following function codes:

- Executive block (FC 243).
- Addressing interface definition (FC 244).
- Input channel interface (FC 245).
- Trigger definition (FC 246).

The INSEM01 module monitors Harmony control units for data on an exception report basis, collects and sorts data it acquires, and provides SOE data to human system interfaces for report presentation after some predefined trigger condition occurs. Digital state transitions are collected at the HCU level by IMSED01 and INSET01 modules, then forwarded to the INSEM01 module. The INSEM01 module records the information and sorts it according to time in an internal database. When a trigger condition occurs, the human system interface is notified and data transfer occurs.

INTKM01

The INTKM01 Time Keeper Master module provides time information to the INSEM01 module and to the rest of the distributed SOE system through the time synchronization link. The INTKM01 module connects to an external receiver using IRIG-B time code link. The module transmits absolute time to the rest of the system using the RS-485 time synchronization link.

The INTKM01 module cable connects to an NTST01 termination unit. In this case, the termination unit provides the connection point for the external receiver signals and also the time synchronization link.

I/O Modules

IMSET01

The IMSET01 Sequence of Events Timing module processes up to 16 digital field inputs, and receives and decodes the time synchronization link information sent by the INTKM01 module for a Harmony controller. The controller utilizes function code 241 (DSOE data interface) to interface SOE data from the IMSET01 module to the INSEM01 module, and function code 242 (SOE digital event interface) to configure and access the IMSET01 module input channels. Each channel is optically isolated, and can be individually programmed for 24 VDC, 48 VDC, 125 VDC, and 120 VAC input.

The module communicates with its Harmony controller over I/O expander bus. Only one IMSET01 module can operate on an I/O expander bus segment. The module cable connects to NTST01 and NTDI01 termination units. The NTST01 unit provides for time synchronization link termination. The NTDI01 unit provides for field wiring termination.

IMSED01

The IMSED01 Sequence of Events Digital Input module is similar to the IMSET01 module except that it only processes up to 16 digital field inputs for the Harmony controller. It does not process time synchronization link information. The controller utilizes function code 242 (SOE digital event interface) to configure and access the IMSED01 module input channels. Up to 63 IMSED01 modules can operate on an I/O expander bus segment along with one IMSET01 module. The NTDI01 termination unit provides for field wiring termination.

Related Documents

Number	Document Title
WBPEEUS240011??	Harmony Rack Input/Output, Overview

Specifications

Property	Characteristic/Value
General	
Mounting	Occupies one slot in a standard module mounting unit.
Environmental	
Ambient temperature	0° to 70°C (32° to 158°F)
Relative humidity	5% to 95% up to 55°C (131°F) (noncondensing) 5% to 45% at 70°C (158°F) (noncondensing) Pollution degree: I
Altitude	Sea level to 3 km (1.86 mi)
Air quality	Noncorrosive
CE mark declaration	This product, when installed in a Symphony cabinet, complies with the following Directives/Standards for CE marking.
EMC96 Directive 89/336/EEC	EN50082-2 Generic Immunity Standard - Part 2: Industrial Environment EN50081-2 Generic Emission Standard - Part 2: Industrial Environment

Property	Characteristic/Value
CE mark declaration *(continued)*	
Low Voltage Directive 73/23/EEC	EN61010-1 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements
Certifications	
Canadian Standards Association (CSA)	Certified for use as process control equipment in an ordinary (nonhazardous) location.
Factory Mutual (FM) (pending for INTKM01, IMSED01, IMSET01)	Approval for the following categories: Nonincendive for: Class I Division 2, Groups A,B,C,D Class II, Division 2, Groups F,G
INSEM01	
Power requirements	
Operating voltage	+ 5 VDC, ± 5% at 1.78 A typical
Power dissipation	8.9 W typical
Microprocessor	16 bits running at 10 MHz
Memory	2 Mb RAM 512 kb ROM 512 kb NVRAM
INTKM01	
Power requirements - Operating voltage	5 VDC, ± 5% at 300 mA typical
Microprocessor	16 bits running at 10 MHz
Communication	
Input	IRIG-B in DC level shift format (through NTST01)
Output	RS-485 time synchronization at 62.5 kbaud (through NTST01)
Output time accuracy	
Synchronization time	±10 µsec
Absolute time (to INSEM01)	±1 msec
NTST01	
Voltage isolation between synchro link and IRIG-B input	1,000 VAC at 50 Hz 2,000 V_P 1.2/50 usec pulse
Cable type	Twinaxial
Maximum cable distance between two HCU cabinets	4,000 m (13,123 ft)
Maximum length between INSOE01 server node and farthest HCU cabinet	40,000 m (131,233 ft)
IMSED01/IMSET01	
Power requirements	
Operating voltage	+5 VDC, ±5% at 350 mA typical
Microprocessor	16 bits running at 10 MHz
Memory	64 kb RAM 64 kb ROM
Communication (IMSET01 only)	RS-485 time synchronization
Digital inputs	
Voltage	24 VDC (±10%) 48 VDC (±10%) 125 VDC (±10%) 120 VAC (±10%) (only for system control logic)

Property	Characteristic/Value
Digital inputs *(continued)*	
Current (typical)	5 mA (24 VDC) 4 mA (48 VDC) 4 mA (125 VDC) 5 mA (120 VAC)
Turn on voltage (minimum)	
24 VDC	21.6 VDC
48 VDC	43.2 VDC
125 VDC	112.5 VDC
120 VAC	108 VAC
Turn off voltage (maximum)	
24 VDC	10 VDC
48 VDC	20 VDC
125 VDC	50 VDC
120 VAC	50 VAC
Maximum input current at minimum turn on	4 mA (21.6 VDC) 4.4 mA (43.2 VDC) 3.2 mA (112.5 VDC) 4 mA (108 VAC)
Maximum off-leakage current (for all DI voltages)	1.5 mA
Response time (typical)	
DC fast	1.1 msec
DC slow	18 msec
AC	5 msec after first positive half cycle
Isolation	1,000 VDC/V_{RMS} channel to system 350 VDC/V_{RMS} channel to channel
Surge protection	Meets IEEE-472-1974 surge withstand capability test

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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

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