

iWARE™ Software Development Suite

Robust Protocol Implementations for the Most Demanding Environments

OFFERINGS

iWARE for Solaris™

iWARE for VxWorks®

iWARE for Linux®

FEATURES

Protocol Modules offered:

- SS7
- ATM
- Frame Relay
- Ethernet
- PPP
- HDLC

Software Portability between most Interphase products is guaranteed thanks to a common API architecture

Software packages feature "plug-configure-and-play" capability

Complete protocol stacks available including integrated upper layers



Even in today's world of advanced technologies, hardware and software integration brings its fair share of hurdles to even the most experienced engineers. In an effort to provide the least amount of complexity and effort on the part of the systems integrator, Interphase has designed a suite of robust integration tools to assure design teams seamless integration.

Interphase software development tools help shorten the learning curve and design cycle for integration projects based on the Interphase communications controllers. Because integrators and equipment providers have diverse development environments, Interphase provides multiple types of development tools, each tailored to the needs of different integration types. Interphase iWARE Software Development Suites offer developers a set of Interphase-developed firmware protocol stacks, accessible via APIs provided by Interphase. By supplying embedded protocol support for multiple protocols, base drivers for the selected operating system, configuration and diagnostic utilities, and sample programs, Interphase iWARE reduces software development time and facilitates faster time to market.

Designed with the customer in mind, iWARE Software Development Suites offer "plug-configure-and-play" capability and software portability between most Interphase products, thanks to a common API architecture. Complete protocol stacks are available, including integrated upper layers from third-party stack vendors. Ask your Interphase sales representative for details.

iWARE Software Development Suite

Main Components of the iWARE Software Development Suite

- Embedded Firmware (Executed by the on-board processor)
- Base Drivers for each supported operating system (Executed by the host processor)
- Configuration and diagnostic utilities
- Sample programs
- WAN API
- Extensive documentation for each component of the suite

iWARE Software Development Suite

- Solaris, VxWorks or Linux device drivers to control the cards and exchange messages between the host and the cards
- SNMP sub-agent to tie the card MIB to the host MIB
- User and kernel API
- PCI console application to access the on-board Boot Firmware and to run Built-in Self Tests on the card
- Several firmware files to be loaded on the cards (There is one binary file per type of firmware)
- Each protocol layer in the firmware maintains SNMP Management Information Bases (MIB)
- Multiple configuration tools to dynamically set-up the cards

- Tools to flash firmware and its initial software configuration in the card memory
- SynWatch Protocol Analyzer software to display the frames exchanged on the line and analyze their contents
- Dump and trace utilities
- LineStat and LineTest tools to monitor and test the physical line
- Automatic configuration process example
- Debugging tools
- Several application samples (Kernel and user samples)
- Complete documentation set including a detailed description of the Interphase iWARE Applications Programmer's Interface (API), the Base Driver's API, sample programs and a tools users guide
- Signaling procedures for the User Network Interface (UNI)

iWARE WAN API

Software consists of various communications protocol stacks, a link manager, and a constant, unified interface to the host. All the embedded software supplied by Interphase runs under the control of a small, proprietary real time kernel. The Interphase software is packaged as a

Software Development Suite. Alternatively, when there is a need for a full-featured OS running on the 8260/860 processor, the kernel can be replaced with an embedded Real Time OS, such as ChorusOS or VxWorks. For those cases, Interphase offers a Board Support Package. Brief descriptions of the protocols provided by Interphase are below.

ATM Protocol

The Interphase ATM protocol support covers AAL0, AAL2 and AAL5 Common Part Convergence Sublayer (CPCS) APIs.

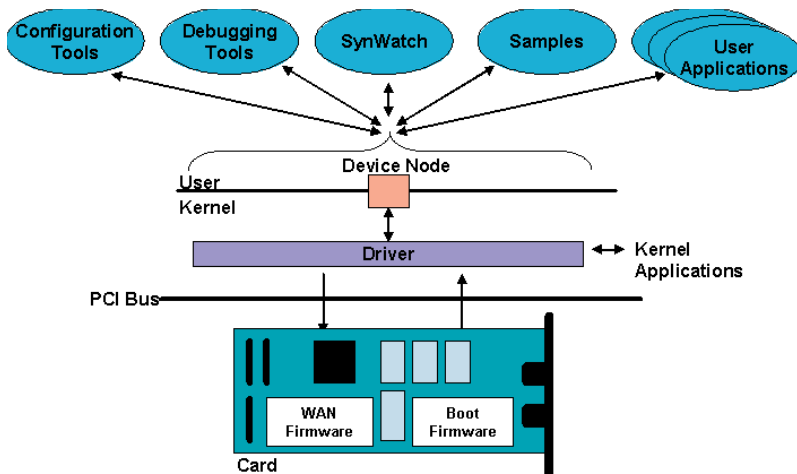
Unrestricted allocation of up to 32 K VPI/VCI virtual connections is supported via the equipped external CAM. Restricted allocation of up to 64 K VPI/VCI numbers is supported via an internal Address Compression Mechanism. The ATM firmware offers the following additional features:

- ATM (AAL0, AAL2, AAL5) interface
- OAM support
- CBR, VBR, ABR (ATM Forum UNI 4.0), and UBR service classes
- ATM MIB (RFC 1695) support

SS7 Module (MTP1, MTP2)

Interphase communications controllers support multi-channel SS7 connections over multiple channelized T1, E1 or J1 lines. An Interphase implementation of SS7 MTP1 and MTP2 is included with the Interphase embedded firmware running on the on-board processor. Interphase MTP2 implements the entire layer 2 functionality, including FISUs stuffing/elimination, Link Synchronization, and error management. MSUs and OAM services are relayed to layer 3 MTP3, which normally run on the host CPU. The SS7 embedded firmware is able to handle up to 128 simultaneous MTP2 sessions. The Interphase implementation of SS7 MTP2 conforms to ITU-T, ANSI, and TTC standards.

General Software Architecture



HDLC Module

The HDLC/transparent mode can be implemented on each individual DS0 channel of the controller, or on any aggregation of DS0s when the controller is connected to ISDN PRI lines, or to channelized, unchannelized, or fractional T1/E1/J1 lines. Up to 248 (a full eight E1, T1 or J1 lines) HDLC/Transparent channels can be activated simultaneously.

PPP Module

The Point-to-Point Protocol (PPP) provides a standard method to transport multi-protocol datagrams over point-to-point links. Interphase PPP implementation complies with the following RFCs:

- 1661 (Point-to Point Protocol)
- 1662 (PPP in HDLC-like Framing)
- 1618 (PPP over ISDN)
- 1570 (PPP LCP Extensions)
- 1333 (PPP Link Quality Monitoring)
- 1334 (PPP Authentication Protocols)
- 1717 (PPP Multilink Protocol)

Interphase controllers support encapsulation of TCP/IP via RFC 1332 (PPP Internet Protocol Control Protocol) and of IPX via RFC 1552 (The PPP Internetwork Packet Exchange Control Protocol).

Frame Relay Module

Interphase modules support an embedded frame relay stack that is compliant with ITU-T Q.933 and ITU-T Q.922. The Interphase implementation includes:

- DLCI management (user defined, automatic)
- Frame size up to 4096 bytes
- Quality of Service management (CIR, Bc, Be, T)
- Congestion management (BECN, FECN, DE)
- User side of the User to Network interface
- Unicast only
- PVC only (up to 976 user's DLCI)
- IP and IPX over Frame Relay (RFC 1490)

SNMP Module

Each protocol layer in the firmware maintains SNMP Management Information Bases (MIBs). The following MIBs are supported:

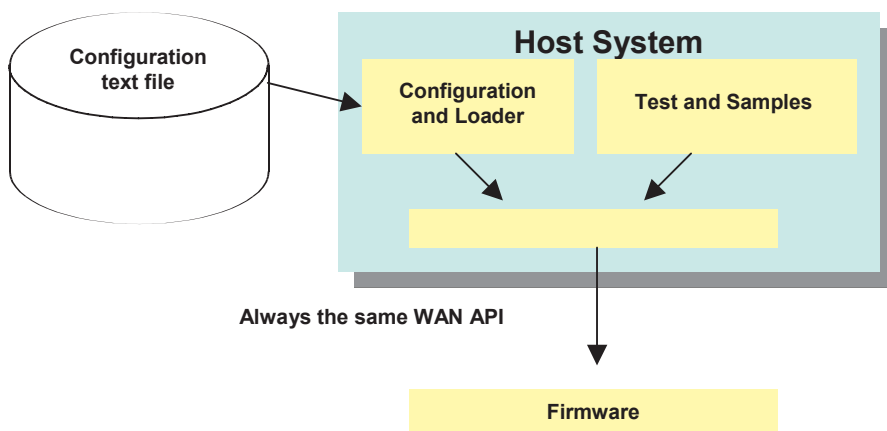
- DS1 MIB (RFC 1406)
- PPP MIB (RFC 1471, RFC 1473)
- FR MIB (RFC 1604)
- ATM MIB (RFC 1695)
- Private enterprise MIB

Board Development Kit

A Board Development Kit (BDK), included with each Interphase hardware module, is designed for firmware developers who are responsible for developing firmware using an Interphase controller. It provides programmers with the information needed to write firmware applications. The BDK includes:

- Board Installation and Maintenance Manual: Provides procedures for installing and maintaining the module
- Setup Utility: Allows the user to modify the content of the various programmable elements of the board, and especially the Flash EEPROM memory
- Interactive Built-in Test Utility: Allows the management of the card such as reset/run action, memory and registers dump, memory and DMA tests, line parameter manipulation, and more
- Hardware Reference Manual: Provides information for developing embedded software and/or host drivers for the module
- Built-in Self Test and Monitor Manual: Provides high-level information for using the boot firmware.

Software Development Suite

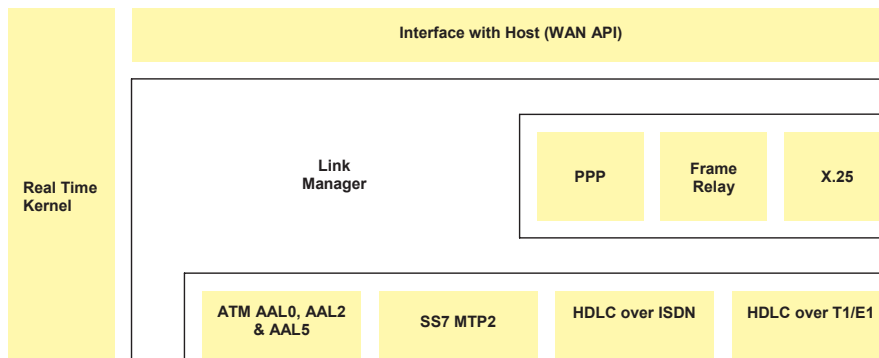


Why Choose Interphase?

- Interphase has built a strong reputation for quality and dependability while maintaining a focus on our customers' needs.
- As an **enabler** of next generation technologies, Interphase provides the know-how, the experience, and the commitment to make new technologies flourish.

- As an **innovator**, Interphase offers the most advanced solutions on the market today.
- As a **partner** in your success, Interphase will stop at nothing to exceed your expectations and enable fulfillment of your project goals.

Embedded Firmware



CONFIGURATION OPTIONS

- 6535-902:** Solaris iWARE Base Module
- 6535-902-SS70:** Solaris-MTP1&2 protocol
- 6535-902-AAL5:** Solaris-AAL0&5 protocol
- 6535-902-HUS7:** Solaris-Hughes MTP1&2 protocol*
- 6535-902-TRS7:** Solaris-Trillium MTP1&2 protocol

- 4539-902:** Solaris iWARE Base Module
- 4539-902-SS70:** Solaris-MTP1&2 protocol
- 4539-902-AAL5:** Solaris-AAL0&5 protocol
- 4539-902-HUS7:** Solaris-Hughes MTP1&2 protocol*
- 4539-902-TRS7:** Solaris-Trillium MTP1&2 protocol

- 4537-906:** VxWorks iWARE Base Module
- 4537-906-SS70:** VxWorks-MTP1&2 protocol
- 4537-906-AAL5:** VxWorks-AAL0&5 protocol
- 4537-906-HDLC:** VxWorks-HDLC protocol
- 4537-906-PPP0:** VxWorks-PPP protocol
- 4537-906-FR00:** VxWorks-Frame Relay protocol

- 4537-907:** Solaris iWARE Base Module
- 4537-907-SS70:** Solaris-MTP1&2 protocol
- 4537-907-AAL5:** Solaris-AAL0&5 protocol
- 4537-907-HDLC:** Solaris-HDLC protocol
- 4537-907-PPP0:** Solaris-PPP protocol
- 4537-907-FR00:** Solaris-Frame Relay protocol

- 4532-905:** VxWorks iWARE Base Module
- 4532-905-AAL2:** VxWorks-AAL2 protocol
- 4532-905-AAL5:** VxWorks-AAL0&5 protocol
- 4532-905-HUL2:** VxWorks-Hughes AAL2 protocol*
- 4532-905-HUL5:** VxWorks-Hughes AAL0&5 protocol*

Please Note: The four digit numbers indicate the hardware configuration for which this software applies. For additional information please refer to Interphase Professional Services documentation.

* Refers to Interphase ATM AAL2, ATM AAL5, or SS7 MTP1/2 protocols that are compatible to Hughes Software Systems protocols, including Interphase-Hughes Convergence Layer Software.

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