Mindtree

Welcome to possible

MEDICINE
HEALTH
TREATMENT
DOCTOR
SURVEY
RECIPE

EtherMind IEEE - 11073 Stack

Build highly interoperable products which supports the
Continua Health Alliance communication standard

Introduction

The Continua Health Alliance (CHA) is an international
industry group of healthcare and technology companies
working towards creating an interoperable healthcare
system. CHA defines guidelines for various systems/devices
to communicate over different interfaces such as the Personal
Area Network (PAN), LAN and WAN, by recommending interoperable
standards and specifications. Mindtree has a **complete
implementation of the IEEE 11073 standards** and supports
all defined device specializations for both the **host and the device**.

Bluetooth and USB are defined as the transport layer for
PAN and Zigbee is defined as transport for LAN interface. For
the PAN and LAN interfaces, CHA defines use of IEEE 11073
personal health device communication standards for
exchange of device-specific information between devices/Agents
such as weight scales, thermometers, blood pressure monitors,
glucose meters and hosts/Managers such as laptops,
smartphones, PCs and tablets. Each of these standards is
called a device specialization in IEEE terms.

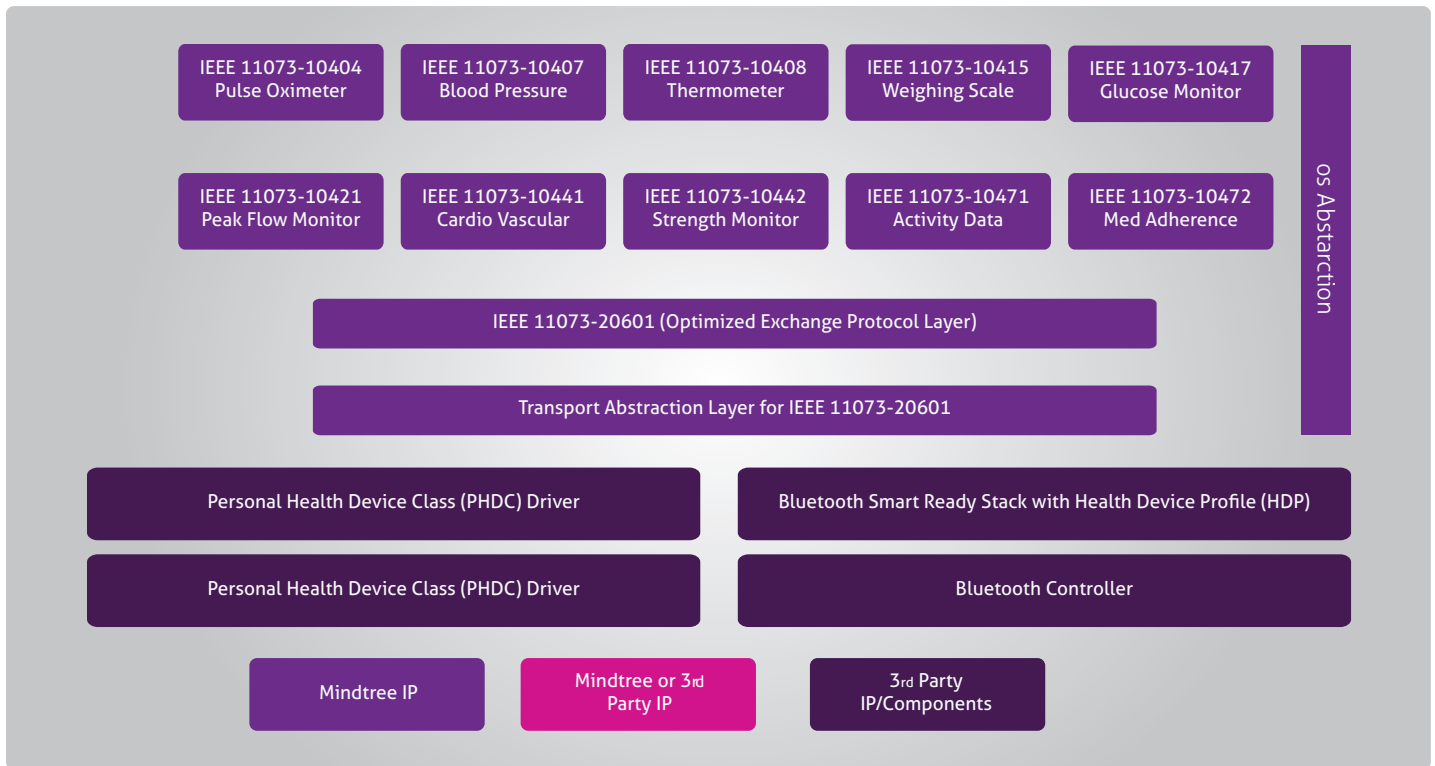## Mindtree's Ethermind IEEE-11073 Solution Offering

The solution comprises of IEEE-11073-20601 (Optimized
Exchange Protocol), comprehensive suite of IEEE-11073
Manager and Agent roles for a host of device specializations
(IEEE-11073-104xx) as adopted by the Continua Design
Guideline. Our implementation supports Agent (Sensor device)
& Manager (Collector device) roles for all device specializations
over Bluetooth Health Device Profile (HDP) & USB Personal
Health Device Class (PHDC) transport.

EtherMind IEEE 11073 Manager is an implementation
of Manager roles for various device specializations
including blood glucose meters and pulse oximeters.
Targeted at devices such as smartphones, PCs, laptops
and tablets, the IEEE-11073 manager provides interfaces
to plug into OEM-specific GUI/ MMI.

EtherMind IEEE 11073 Agent is an offering which supports
a host of device specializations as per the Continua Design

Guideline 2014 specifications. Devices include blood pressure monitors, weighing scales, cardiovascular fitness and activity monitors, thermometers, glucose meters, pulse oximeters, strength fitness equipment, and independent living activity, peak flow and adherence monitors. The Agent implementations are specially designed to fit into resource-constrained systems like 8 bit micros with minimal RAM, Flash memory and MIPS.

IEEE 11073-10404 Pulse Oximeter	IEEE 11073-10407 Blood Pressure	IEEE 11073-10408 Thermometer	IEEE 11073-10415 Weighing Scale	IEEE 11073-10417 Glucose Monitor	OS Abstraction
IEEE 11073-10421 Peak Flow Monitor	IEEE 11073-10441 Cardio Vascular	IEEE 11073-10442 Strength Monitor	IEEE 11073-10471 Activity Data	IEEE 11073-10472 Med Adherence	

IEEE 11073-20601 (Optimized Exchange Protocol Layer)

Transport Abstraction Layer for IEEE 11073-20601

Personal Health Device Class (PHDC) Driver	Bluetooth Smart Ready Stack with Health Device Profile (HDP)
Personal Health Device Class (PHDC) Driver	Bluetooth Controller

Mindtree IP	Mindtree or 3rd Party IP	3rd Party IP/Components

Key Benefits

Reduced technical risk
- Certified and compliant to Continua Health Alliance Design Guideline
- Integrated in multiple products by OEMs
- Comprehensive offering supporting array of managers and agents as mentioned in Continua Guideline

Faster time-to-market
- Complete implementation in ANSI C to enable easy portability across various micro controllers
- Transport abstraction to enable use of IEEE layers on either Bluetooth or USB transports
- OS abstraction layer to enable easy porting cross OS platforms

Cost optimization
- Extremely low memory footprint

Key Deliverables
- IEEE stack written in ANSI C consisting of:
  - IEEE 11073-20601 (Optimized exchange layer for agent and manager)
  - Device specialization(s) requested by customer
- Source code of transport abstraction layer and operating system abstraction layer
- Source code of sample applications to illustrate the use of APIs for IEEE Stack

- Documentation:
  - API documents for IEEE layers optimized exchange layer and device specializations
  - API documents for the transport abstraction layer
  - API documents for the operating system abstraction layer
  - User manual describing how to build and run the sample application

Continua Certification

Mindtree's EtherMind IEEE- 11073 stack is an optimized, abstracted and layered solution which is Continua Health Alliance certified (Search for Mindtree) supporting multiple platforms to suit the needs of OEMs in medical, health, and fitness industry segments as well as PC and mobile phone manufacturers.

With CHA's defined interoperable system, one vendor's device will be able to seamlessly communicate with other vendor's host, and all these devices can easily become part of a larger healthcare system.

Mindtree's CHA- certified EtherMind IEEE-11073 Stack can be used in both the small sensor devices and relatively larger collector/monitoring equipment hosts such as laptops, smartphones, tablets and PCs,interacting with each other using wired or wireless PAN or LAN.

Mindtree Leadership

Mindtree has provided inputs to several IEEE specifications and CHA during the development,verification and qualification process of its IEEE-11073 Stack. Mindtree's implementation will also be used as a reference system by multiple CHA certification houses to ensure interoperability of the new systems under certification. Leveraging our experience and expertise in Bluetooth SIG and CHA certification, we offer consultancy services and assist manufacturers with qualification in various forums. We also have the expertise to realize new specifications; we help manufacturers realize new use cases.

Mindtree's lead engineers have been on the Bluetooth Architecture Review Board (as Councilors) and on the Medical Working Group (Co-chair).

Mindtree's customers of the IEEE-11073 IP include Roche Diagnostics USA and Germany. Roche's medical products are mass produced with Mindtree's IEEE-11073 IP over both the USB and the Bluetooth transports. QNX Software Systems, Canada has integrated the Mindtree IEEE 11073 IP and Bluetooth IP with its popular QNX Operating System.

Bluetooth Leadership Credentials

MIndtree is a pioneer in Bluetooth IP licensing and providing engineering services for semiconductor companies and OEMs.

50+
Proposal wins with IP

35 mn+
Products shipped with IP

500+
Person-years of investment

40 +
Unplug Fests attended

Co-creator of
4.0 & 4.1
specifications

5 Offshore development centers for top OEMs

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