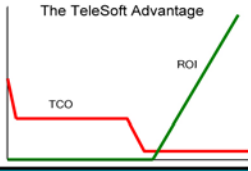
TeleSoft International

Protocols for Developers



Proven advanced starting points

TsLink3 ISDN SDK — Source Code Stack

TsLink3 ISDN/Q.931/Q.921/DSSI

TsLink3 Basic Rate ISDN (BRI) and Primary Rate ISDN (PRI) Source Code stacks provide advanced starting points for a wide range of communications products. TsLink3 ISDN Software Development Kits (SDKs) are fully compliant with the ITU-T Q.931 and Q.921 recommendations and with the ETSI ETS 300 125 and ETS 300 403 standards. TsLink3 BRI and PRI software modules have been extensively tested at many conformance centers in Europe, North America, Japan and Australia and deployed worldwide in millions of products.

Available integrated with the TsLink3 Q.931 and Q.921 source code modules are proven software modules for: Multi Level Precedence and Preemption, Supplementary Services, AutoSPID, Autoswitch Detection, NFAS, D-Channel Backup and Physical Layer drivers.

High Availability Option

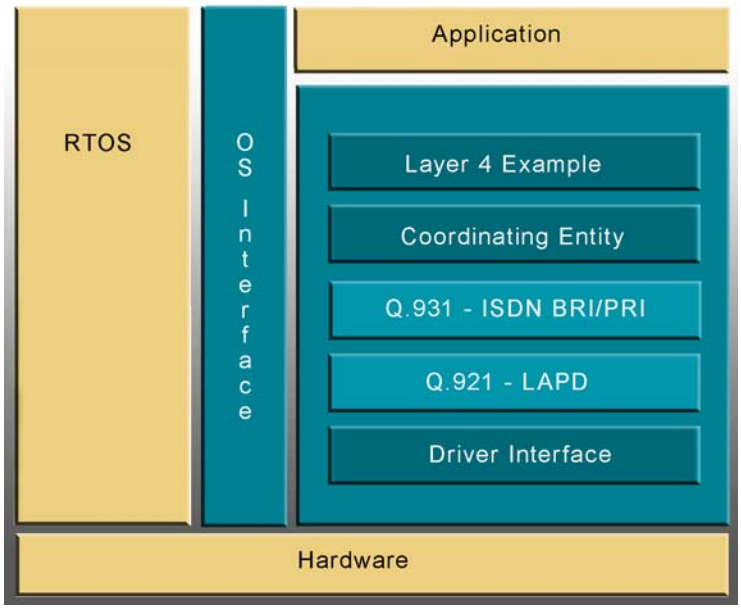
TsLink3 ISDN software supports High Availability (HA) applications for high density switches with multiple modes of HA operation, including the seven key elements of HA. Please refer to the TeleSoft HA White Paper for details. Applications requiring HA will benefit from the TsLink3 stack capacity to support up to 7,900 simultaneous connections and up to 256 ports.

Q.931 Features

- Supports BRI and PRI applications
- All country variants are selectable at run time or compile time
- Network (NT)- and Terminal (TE)- Side Support
- Supports concurrent operation of BRI and PRI, NT and TE with any switch variant
- Easy to correlate source code with documentation, due to mapping code structure directly to Q.931 SDLs (Specification Description Language Diagrams).
- Maintain smaller code size when using both NT- and TE-side code, due to reuse of core elements for both network- and terminal-side.

Q.921 Features and Support

- ETSI ETS 300 125
- Supports BRI configurations
  - Point-to-Point
  - Point-to-Multipoint
- Supports PRI configuration
  - Point-to-Point
- Network (NT)- and Terminal (TE)- Side Support
- TEI Management
- Data Link Core
- Error Correction
- Provisioning & Reprovisioning
- One LAP module supports multiple LAP protocols (LAPD/LAPB/V.120 Layer 2) reducing memory space and OS tasks
- Single OS task allows efficient handling of fixed and automatic TEIs
- Code structure maps directly to Q.921 state tables for easy correlation with documentation



Note: The Layer 4 example is provided as a template for API interactions.

ISDN BRI Features and Support

- Network (NT)- and Terminal (TE)- Side Support
- Worldwide switch coverageNorth America
  - National ISDN-1
  - Nortel DMS-100/250 (NIS S208-6)
  - Lucent 5ESS8 & 9 Custom 235-900-343
  - Telcordia Generic SR-NWT-001953
  - Telcordia NI-1 SR-NWT-002361
  - GTE GTD-5 EAXAPI Server
  - EuroISDN ETSI DSS1 NET3 (TBR3) for all EuroISDN switches including deltas for:
    - Austria
    - Belgium
    - China
    - Denmark
    - France (EuroNumeris)
    - Finland
    - Germany (BAPT 223)
    - Holland
    - Hong Kong (HKTA 2015)
    - Hong Kong (HKTA 2027)
    - Italy
    - Ireland
    - Korea
    - New Zealand
    - Norway
    - Portugal
    - Singapore
    - South Africa
    - Spain
    - Sweden
    - Switzerland (SwissNet-3)
    - U.K.
  - Australia TS-031 and TS-013 (old standard)
  - Japan NTT INSNet64 and KDD ISDN
  - France VNx (old VN2, VN3, VN4 standards)
  - Germany 1TR6 (old FTZ 1987 standard)
  - Hong Kong (old CR13 standard)
- AutoSPID selection per Telcordia SR-3888
  - Includes Automatic Number Load (ANL)
- Autoswitch Detection per Telcordia SR-3888
- North America National ISDN-2 with Parameter Download
- Supplementary Services
  - US National ISDN
  - Lucent 5ESS Custom
  - Nortel DMS 100/250 Custom
  - EuroISDN ETSI Compliant

ISDN PRI Features and Support

- Network (NT)- and Terminal (TE)- Side Support
- Worldwide switch coverage
  - North America
    - National ISDN-2 + TR41459 (Lucent 4ESS & 5ESS)
    - Nortel DMS-100/250 (NIS A211-1 BCS 36)
    - Lucent 5ESS5 Custom 801-802-100
    - Lucent 5ESS10 Custom 235-900-342
    - Telcordia National PRI TR-NWT-002343
    - Telcordia Generic PRI TR-NWT-001268
    - GTE GTD-5 EAX
  - EuroISDN ETSI DSS1 TBR4 (NET5) for all EuroISDN switches including deltas for:
    - Austria
    - Belgium
    - China
    - Denmark
    - France (EuroNumeris)
    - Finland
    - Germany (BAPT 223)
    - Holland
    - Hong Kong (HKTA 2015)
    - Hong Kong (HKTA 2027)
    - Italy
    - Ireland
    - Korea
    - New Zealand
    - Norway
    - Portugal
    - Singapore
    - South Africa
    - Spain
    - Sweden
    - Switzerland (SwissNet-3)
    - U.K.
  - Australia TS-038 and TS-014 (old standard)

  - Hong Kong (old CR13 standard)
  - Japan NTT INSNet1500 and KDD ISDN
- NFAS (in support of NI-2 + Lucent 41459 + Nortel DMS100/250 PRI), NT & TE
- D-Channel Backup (in support of NI-2), NT & TE

Typical applications:

- Signaling Gateways
- ISDN Terminals
- Integrated Access Devices (IADs)
- ISDN telephones
- Base stations
- Media Gateways
- Switches
- Telephony
- Test equipment
- Customer Premise Equipment

TeleSoft Advantages

TsLink3 software stacks are specifically architected for all types of embedded and host-based applications and are optimized for excellent performance and small code size.

Written in ANSI C and delivered as source code SDKs with a pre-ported interface to a defined RTOS of your choice, TsLink3 stacks give you an advanced starting point to shorten your development schedule, minimize technical risk and maintain the flexibility to exercise full control over your end product.

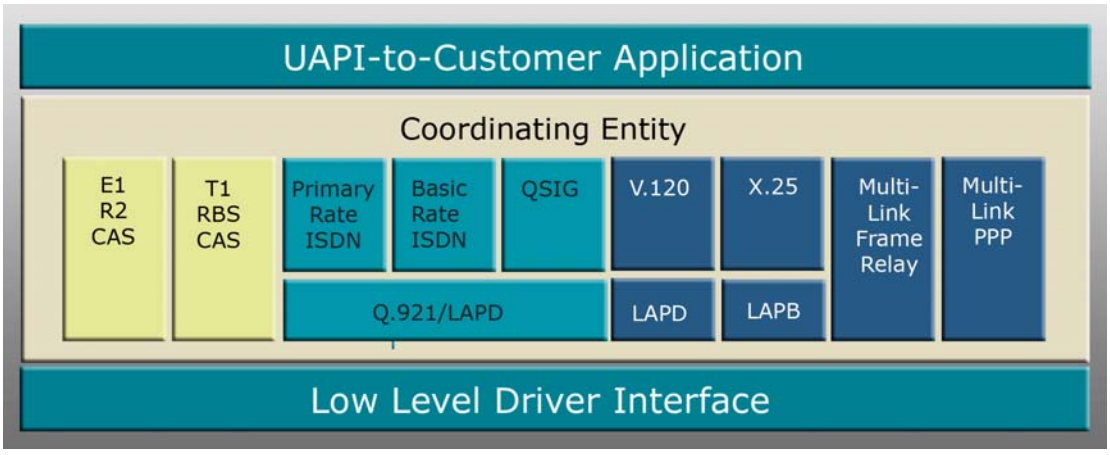
All TsLink3 protocol software stacks are based on a Standard Core Architecture (SCA) with a Universal API (UAPI) that enables easy migration between different stacks and portability to different software/hardware platforms.

Universal Application Programming Interface (UAPI)

TsLink3 code includes a rich message-based Universal API (UAPI) which presents a simple interface for simple applications such as signaling-only. UAPI also provides the versatility and power needed to support more complex configurations which combine signaling with data protocols or with specialized hardware. The TsLink3 Universal API coupled with the straightforward structure of the TsLink3 protocol stack enables you to easily follow the API message flow through the code to determine where to make modifications required for your application.

The majority of simple signaling-only applications require a very small subset of the TsLink3 API messages and parameters - and the non-applicable messages can be disregarded and unused parameters set to zero. More complex applications benefit from the large set of messages and parameters that we provide as templates.

UAPI is common across all TeleSoft stacks which decreases the time and effort required to add upgrade modules to an existing TsLink3 stack and to develop with additional TeleSoft stacks.



Software Tools

Internal Protocol State Logging Tool and Debugging Tool are invaluable aids during portation and integration, included with every TsLink3 stack at no additional charge.

Upgrade and Individual Modules

Completing the solution are upgrade- and individual-modules that increase your market opportunity by increasing your products' connectivity capabilities. Modules include High Availability, PPP, ML-PPP, X.25, MLPP, Frame Relay, T1 RBS, E1 CAS, R2, V.120, and Supplementary Services.

Purchasing TsLink3 Software

TsLink3 Source Code is supplied in comprehensive, portable packages of 'C' source code modules and interfaces necessary to develop robust products. Source Code packages provide source code from Layer 1 device driver software up through the Layer 3/Layer 4 interface of the OSI model. Cost-effective one-time licensing fee; no royalties or user-fees for TsLink3 source code.

Well-Structured, Maintainable Code

Maintainability and scalability are designed into each TsLink3 stack. Comprehensive comments and documentation support you as your product goes forward. The value of TsLink3 stacks will be evident in each phase of your engineering schedule and the product life span.

Shorter Learning Curve & Faster Customization

- ITU-T primitives and software structure – make it easy to relate TsLink3 code to other ITU-T based protocols.
- ETSI/ECMA compliant code - ensures interoperation with other equipment (e.g., PBX) that is ETSI/ECMA compliant.
- 'C' switch statements that closely correspond to the ITU-T standard - straightforward to read and modify code, and locate the event/state action points in the ITU-T standard.
- Adherence to ANSI 'C' standards – provides for full portability.
- OS-independence - choice of RTOS, not locked into a single vendor.
- Processor-independence - enables mobility across CPU platforms.
- Simple state machine design - easy to understand and change code for national specific variants.
- Consult with our experienced engineers early to avoid expensive pitfalls later.

Faster debugging

- Specific defined constants, comment strings and variable naming - supports use of text search techniques to quickly locate a specific section of code and determine the side effects of changes that are being considered.
- ITU-T primitives and software structure - clear traceable dataflow.
- Development and testing on TsLink3 hardware - clean, proven and robust code.

Smaller inventory

- Each line can be configured at run-time for a different T1, E1, R2, PRI or BRI variant
- Co-resident T1, E1, R2, ISDN PRI and BRI switch variants, Frame Relay, X.25, MLPP, PPP, and ML-PPP stacks.

Documentation

Comprehensive documentation customized for your load. Provided in a searchable soft format. All nomenclature complies with ITU-T.

Technical and Custom Support

3-months included with each license. 12-month maintenance extensions include code updates and quick-response technical support via E-mail, phone and fax.

About TeleSoft International

TeleSoft International, Inc., is an industry-leading, US-based provider of field-proven, scalable, standards-based protocol stacks for developers. We specialize in telecom applications, licensing source code stacks to OEMs and ODMs worldwide for VoIP, ISDN, Q.931, Q.921, QSIG, Supplementary Services, ML-PPP, PPP, Frame Relay, T1 RBS, E1 CAS R2, and X.25.

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