

VoIP Intercom / IP Phone

Network Packet-based Intercom Subsystem (ISS)

Adaptive Digital Technologies, Inc.

PRODUCT DESCRIPTION

Adaptive Digital's ISS is a software subsystem that simplifies software design of an IP intercom or IP phone. ISS runs on both the Texas Instruments TMS320DM814x, and DM816x, dual-core devices that contain an ARM Cortex-A8, and a C674x DSP. ISS implements complete VoIP capability all the way from PCM to Packet and back. This includes a process running on the ARM under Linux as well as all the necessary voice processing running on the DSP core.

A user's application, co-resident on the ARM, can set up and tear down VoIP channels via the ISS API. The ISS software takes care of everything else.

MODES of RTP CONNECTIVITY

- point-point (full-duplex)
- point-to-multipoint (half-duplex)
- broadcast (half-duplex)



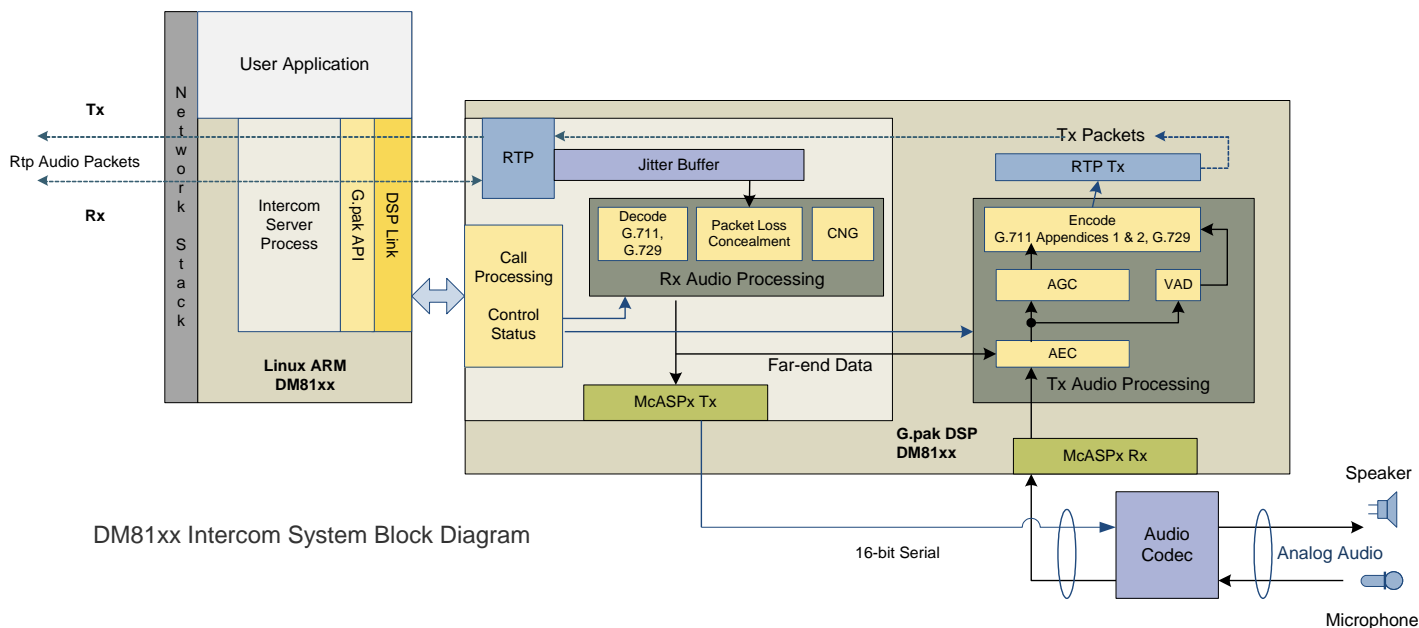
DSP ALGORITHMS AND FUNCTIONALITY

- Digital Gain Control
- Noise Reduction
- Generation-4 Acoustic Echo cancellation
- VAD/CNG
- RTP + Jitter Buffer
- AGC
- G.729AB
- G.711
- Audio interface control via McASP

FEATURES & BENEFITS

The VoIP software includes Adaptive Digital's Gen-4 Acoustic Echo cancellation, which incorporates a noise reduction feature, as well as anti-howling, nonlinear processing, and double-talk detection.

Should modifications be necessary for your project, customization is available.

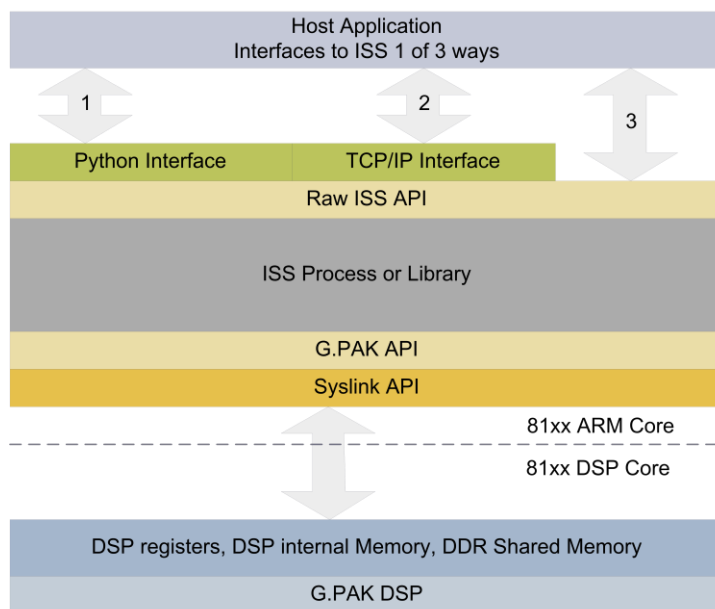


DM81xx Intercom System Block Diagram

STATUS AND CONTROL

There are several ISS control/status interface options available to the user application:

- Direct calls into the raw ISS API – The user application is co-resident with the ISS on the ARM processor and calls ISS APIs directly. The raw ISS API functions call the appropriate G.PAK API functions, which in turn, control the DSP.
- TCP/IP interface to ISS control/status API –The ISS acts as a server, and processes control API messages received on a TCP/IP socket from an ISS client running under the user’s application. The client need not be co-resident with the ISS software on the ARM device. The ISS server translates the control messages into raw ISS API function calls. Status messages from the ISS are sent to the client over the TCP/IP socket.
- Python interface to control/status API - The ISS runs as a server daemon using a Python class. A set of Python APIs are provided to the host application to control the ISS. Status information is sent back to the host via Python callback functions. The Python server implementation calls the raw ISS API functions.



The TCP/IP control/status APIs and Python RPC functions provide the user application a mechanism for remotely setting-up and tearing-down calls. Subsequent status messages are returned to the client.

The ISS ARM-side software can be built to run as a Linux process or as a linkable library. In addition to supporting user application control/status, the ISS software is responsible for booting and downloading the DSP portion of the DM81xx device, controlling the DSP's operation, and the timely transfer of RTP packets between the network stack and the DSP software.

HOST PROCESSING

	Raw ISS Control Interface	TCP/IP Control Interface	Python Control Interface
ISS API C-Code	x	x	x
ISS TCP/IP API C-Code		x	
ISS TCP/IP Client C-Code		x	
Python Server API code			x
Python Client code			x

ISS Host Software Components

FUNCTIONS

```
ISSConfigChannel ( )      configures a channel and opens RTP connection
ISSTearDownChannel ( )   teardown channel and close RTP connection
ISSSetSpeakerGain ( )    adjust the intercom's speaker volume
ISSGetEvent ( )          check for a status event from the server
```

Note: Your design may vary, intercom image for reference purpose only.

Deliverables

The deliverable items are platform dependent. In general, there is one library. (Sometimes multiple variants of the library are included in the deliverables.) There are also header files, some of which are specific to the product and others are common across many of Adaptive Digital's products. Also included in the deliverables is product documentation, which includes a users guide and usually includes release notes and a data sheet. Sample/test code may be included as well.

Adaptive Digital is a member of the Texas Instruments Developer Network, and ARM Connected Community.

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