

# ULE: The Concentrator – Addressing the technology solution

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## Introduction

ULE (Ultra Low Energy) is an ideal technology solution for home control and automation services and devices. Based on the mature and proven ETSI standard DECT (Digital Enhanced Cordless Telecommunications) technology, ULE is positioned at the forefront of competing solutions, given its superior range, exceptional security, high capacity, video/audio capabilities, low cost of ownership and interference-free dedicated licensed-exempt spectrum.

This paper focuses on the function of the Concentrator in the Home Network, and takes a look at DSP Group's proposition for addressing this market.

To find out more on the technology itself, please see ULE: A technology overview.

## The DECT-ULE Network



**Network Nodes:** If you would like to read more on the technology application for the sensors and actuators, please see ULE: The Network Nodes – Addressing the technology solution

**The Concentrator:**

In a home network with ULE, the concentrator is the pivot for the various different nodes in the system (sensors and actuators). In the simplest case, the concentrator can be a home gateway with an integrated DECT chip, which either already supports ULE or can be updated to support ULE by means of a simple, software upgrade. It is anticipated that in the near future more and more home gateways will be made ULE-capable by a software update. Another option is to use a dedicated concentrator or Over The Top box (OTT), which either possesses local management functions or is connected to the Internet by Wi-Fi, telephone line, Ethernet, etc.. Also available are USB dongles, which have implemented a DECT/ULE concentrator. In principle it is also possible for regular DECT telephones to be extended by ULE, and for both functions to be integrated in one base station.

**Home Gateway Topology**



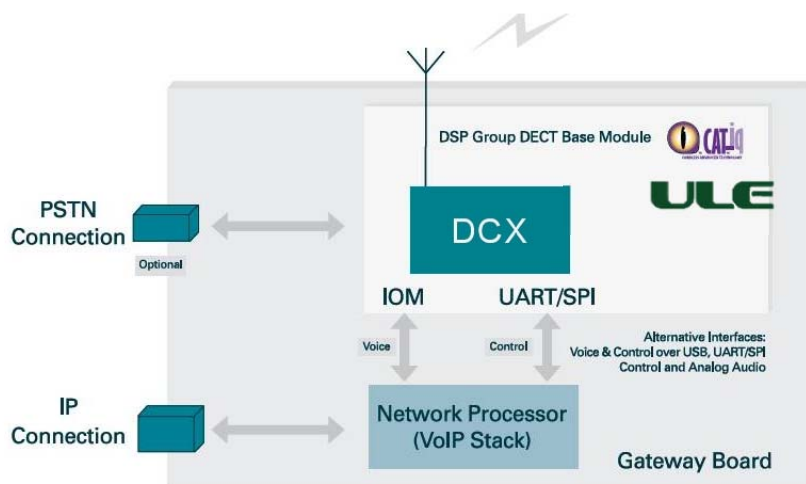
**Over the Top (OTT) Topology**



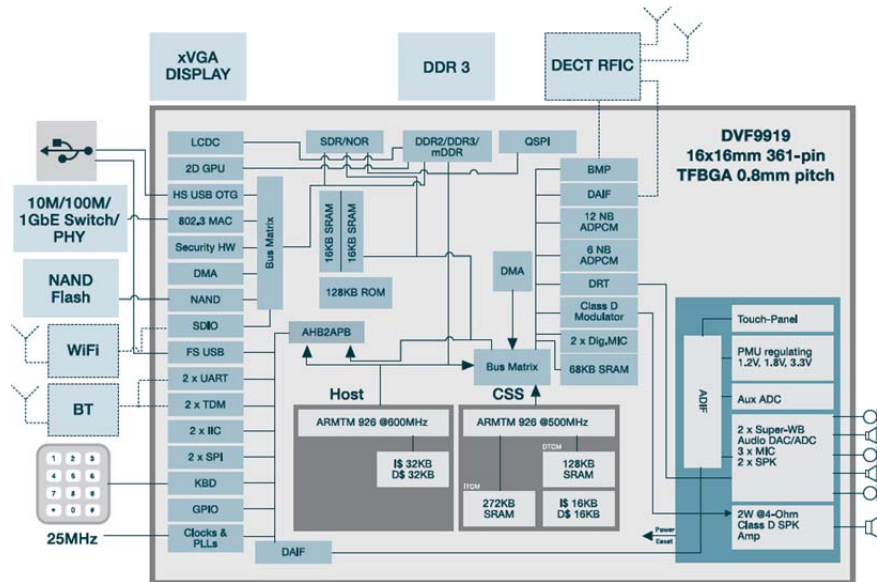
### DSP Group's High and Low End System-On-Chip Solutions

For all the application situations referred to here by way of example, DSP Group can offer the appropriate System on Chip (SoC) solutions. These chipsets range from simple SoCs with real-time operating systems through to complex solutions based on Linux and, in addition to DECT and ULE function performance, also contain a complete telephone solution with up to 8 channels for VoIP and hundreds of ULE registered devices.

The lower end is covered by the DCX family, which can function as concentrator for many ULE devices, and at the same time offer the complete speech function capacity (GAP/CAT-iq 1.0/2.0/2.1/3.0 SUOTA). Other features are an integrated USB interface, line interface, UART, SPI and 2x AD/DA converters. The DCX81 is an extremely cost-optimized chip, the code of which is executed from an external Quad SPI Flash, and therefore also offers software update function performance. The use of the DCX81 millions of times in regular DECT telephones offers the customer an extremely stable, market-tested and proven platform, covering a wide range of applications and makes it perfect for Home Gateway and Over the Top box.



The high end is covered by the DVF99 SoC, with multi-ARM926™ cores architecture including robust security and advanced peripherals, combined with a smart multi-bus architecture and large dedicated on-chip TCM (Tightly Coupled Memory). The DVF99 provide the best solution for ULE, Over the Top boxes utilizing its integrated Linux machine and capability to support all IP Processing.



**Software:**

DSP Group sees itself as a system provider, offering full hardware and software reference design, and not simply as a chip manufacturer. All the integrated circuits are offered with an extensive software package. These contain the operating system (embedded or Linux), DECT Stack, ULE Stack, audio functions such as Codex and echo suppressors, as well as extensive example applications.



### About DSP Group

DSP Group<sup>®</sup>, Inc. (NASDAQ: DSPG) is a leading global provider of wireless chipset solutions for converged communications. Delivering semiconductor system solutions with software and reference designs, DSP Group enables OEMs/ODMs, consumer electronics (CE) manufacturers and service providers to cost-effectively develop new revenue-generating products with fast time to market. At the forefront of semiconductor innovation and operational excellence for over two decades, DSP Group provides a broad portfolio of wireless chipsets integrating DECT/CAT-iq, ULE, Wi-Fi, PSTN, HDClear™, video and VoIP technologies. DSP Group enables converged voice, audio, video and data connectivity across diverse mobile, consumer and enterprise products – from mobile devices, connected multimedia screens, and home automation & security to cordless phones, VoIP systems, and home gateways. For more information, please visit [www.dspg.com](http://www.dspg.com)



**DSP Group is a Promoter Member of the ULE Alliance**

### About CODICO

The COmponent Distributing COmpany, better known as CODICO, is a name that stands for the design-in distribution of high-quality active and passive electronic components and interconnect systems. CODICO is an independent, privately owned company with headquarters in Perchtoldsdorf, Austria, on the southern outskirts of Vienna. In addition to 17 sales offices in Germany, the international CODICO team consists of one office each in Denmark, Italy, France, United Kingdom and eight partner companies in Central and Eastern Europe. Backed by a high level of technical expertise, we place a key focus on design-in services for our customers. CODICO's core business thus consists of providing technical support from the initial development phase through to the end product, along with the sale of only high-quality electronic components.

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