uLan Communication Protocol for Laboratory Instruments, Home Automation and Field Applications

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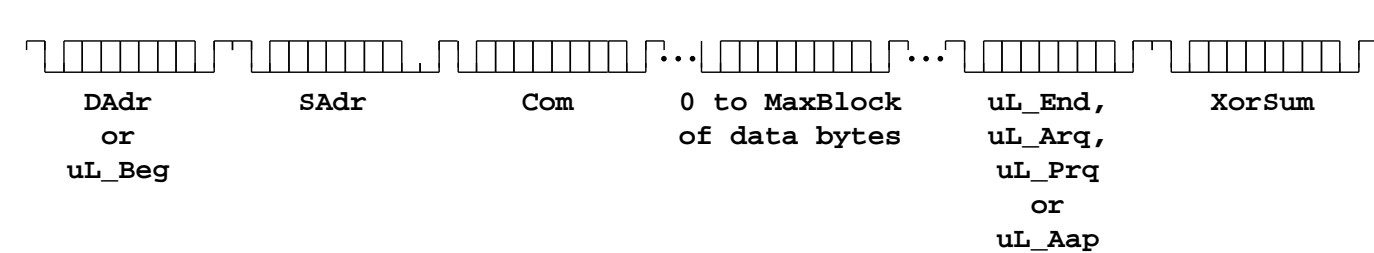Faculty of Electrical Engineering, Czech Technical University

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www.chromulan.org
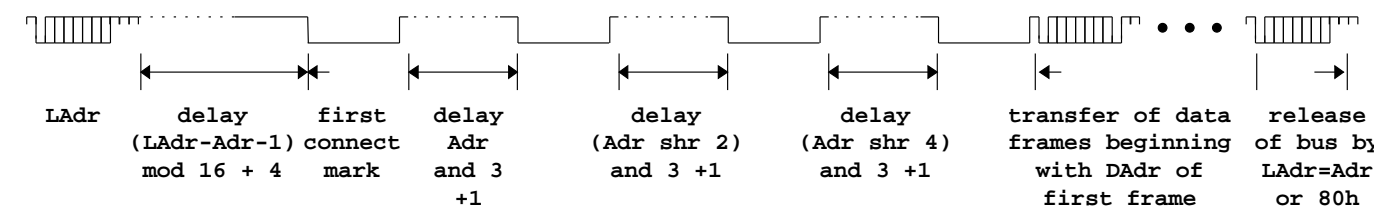
uLan Message Protocol

uLan is multi-master message oriented communication protocol which utilizes RS-485 signal levels. Use of 9-bit character simplifies transfer of binary data. The data frame is a basic communication unit of the uLan protocol. The frame has its destination, source node, frame type or command, end mark and integrity check xor_sum.

Data frame format

| DAdr or uL_Beg | SAdr | Com | 0 to MaxBlock of data bytes | uL_End, uL_Arq, uL_Prq or uL_Aap | XorSum |

The deterministic arbitration is achieved by timing rules for media access sequence.

Bus request and release

Many of todays microcontrollers implement 9-bit extension in their UART (all Intel 8051 and 8096 based MCUs with UART, members of Motorola 683xx family - 68376, Hitachi H8 microcontrollers, TI msp430 to name some of them). Intel has developed a multi-protocol UART i82510, which is very well suited for implementing 9-bit communication interface for PC computers. The second example of the chip, which is well suited for 9-bit communication, is OX16C954-PCI produced by Oxford Semiconductors

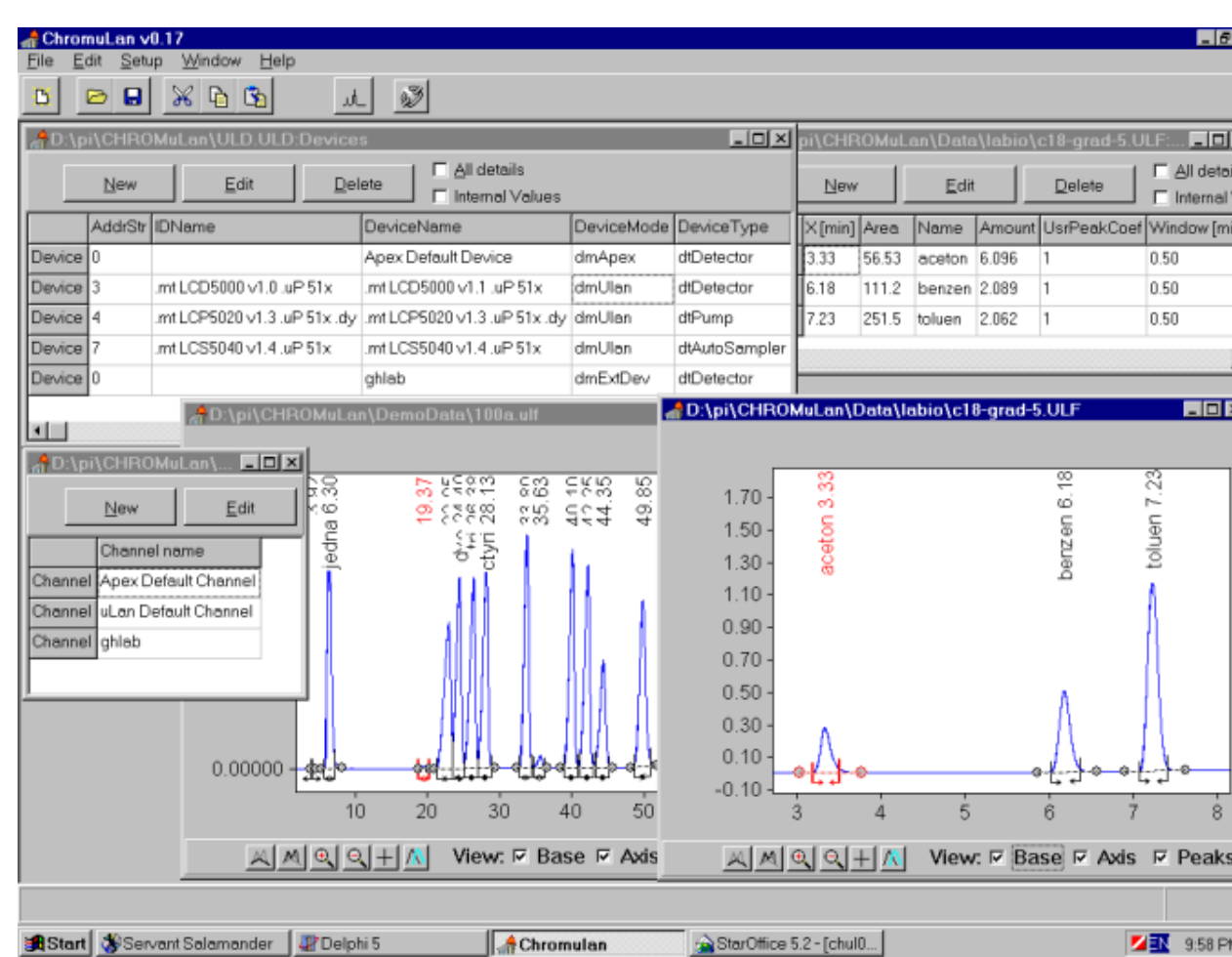Actual version of driver support this platforms:

- DOS
- Windows - 98/2000/XP with WDM driver model
- Linux - 2.4.x as well as 2.6.x

The USB to uLan converter support is under development now.

uLan software and dodumentation pages: **http://ulan.sourceforge.net/**.
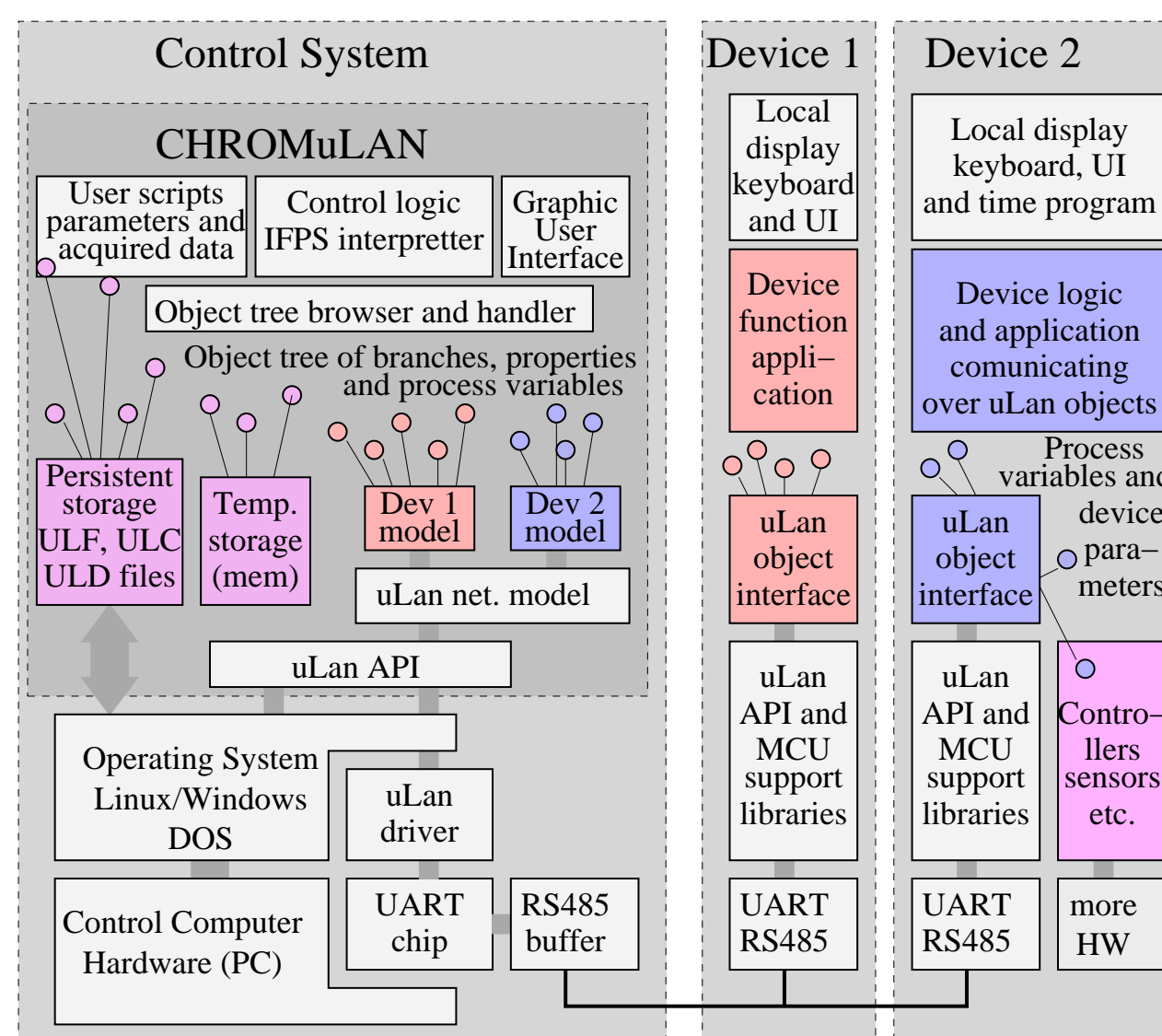
CHROMuLAN

CHROMuLAN HPLC system software provides affordable solution for HPLC assay mathematical data processing and complex HPLC instruments sets control over uLan communication network.

There is more HPLC instruments which can be directly connected to the uLan bus.

AAA-400
Amino Acid Analyzer

LCP5020
HPLC Pump

LCS5040
Autosampler

LCD500
UV-Vis HPLC Detector

The communication with instruments over uLan network is realized as reading and witting device models properties. The models of the devices connected to the uLan network are built automatically from process variables and properties description exported by each instrument.
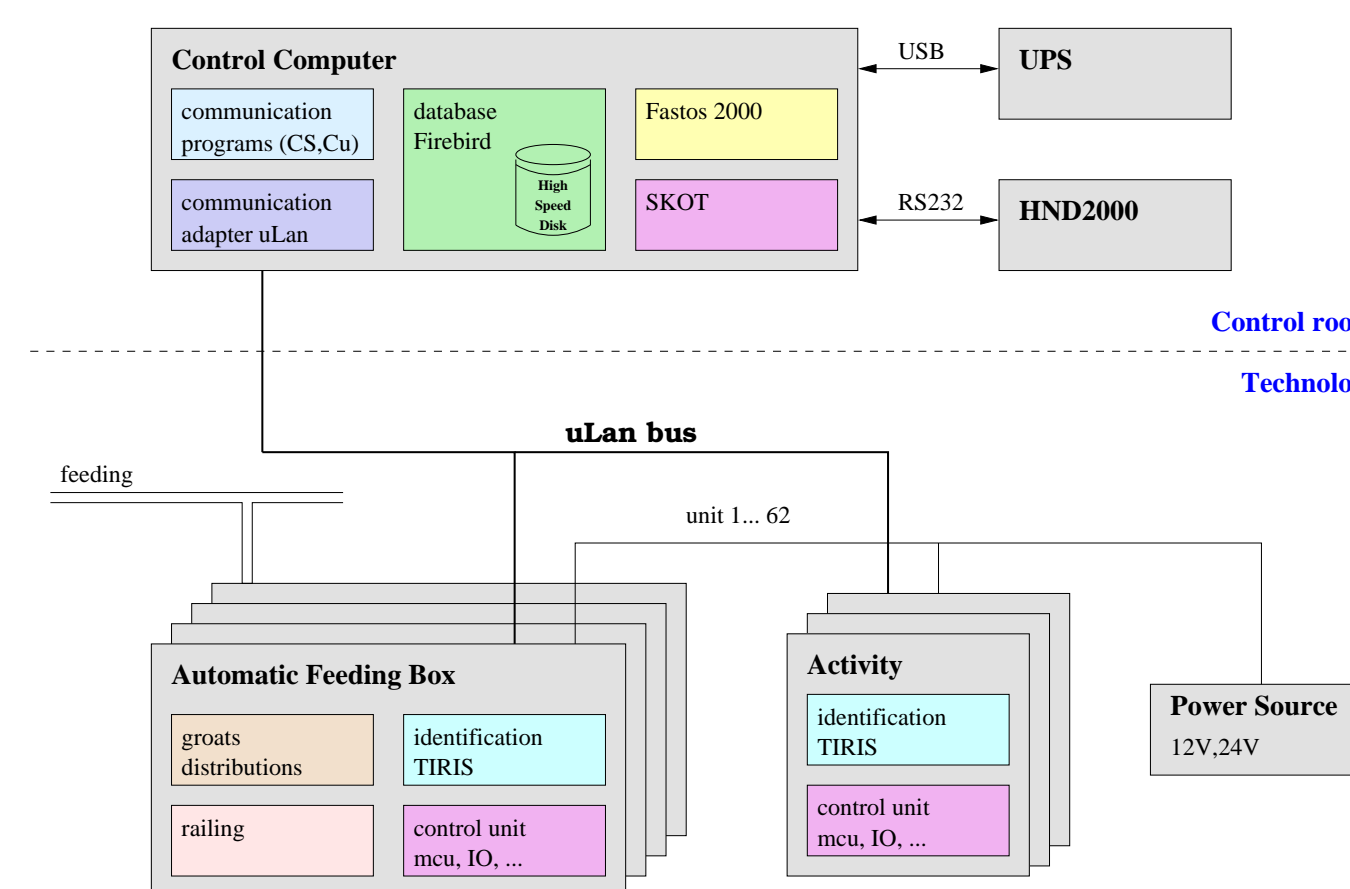

More about CROMuLAN project can found at **http://www.chromulan.org/**.

FASTOP, HA

The Czech company Agrosoft Tábor is producer of FASTOP and FASTOS systems for automatic batch distribution of feed to pigs and cows.

The system takes advantage of uLan multi-master architecture, which reduce data traffic. Wireless identification needs co-ordinate transmit and receive functions in order to avoid mutual interference. This function is done by periodic sending a broadcast message.

The multi-master capability of uLan, very low cost interconnection with use of an phone line grade cable, free bus topology are reasons to used it for Home Automation.