

Qt5 on a microcontroller!

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07.10.2014

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Motivation

| Customer request

- Feasibility of Qt5 for a certain embedded application
- Target: ARM Cortex-M3
- Initial thought: μ Clinux
- Requirements: use only the internal 128KB RAM, no external RAM
- No way!

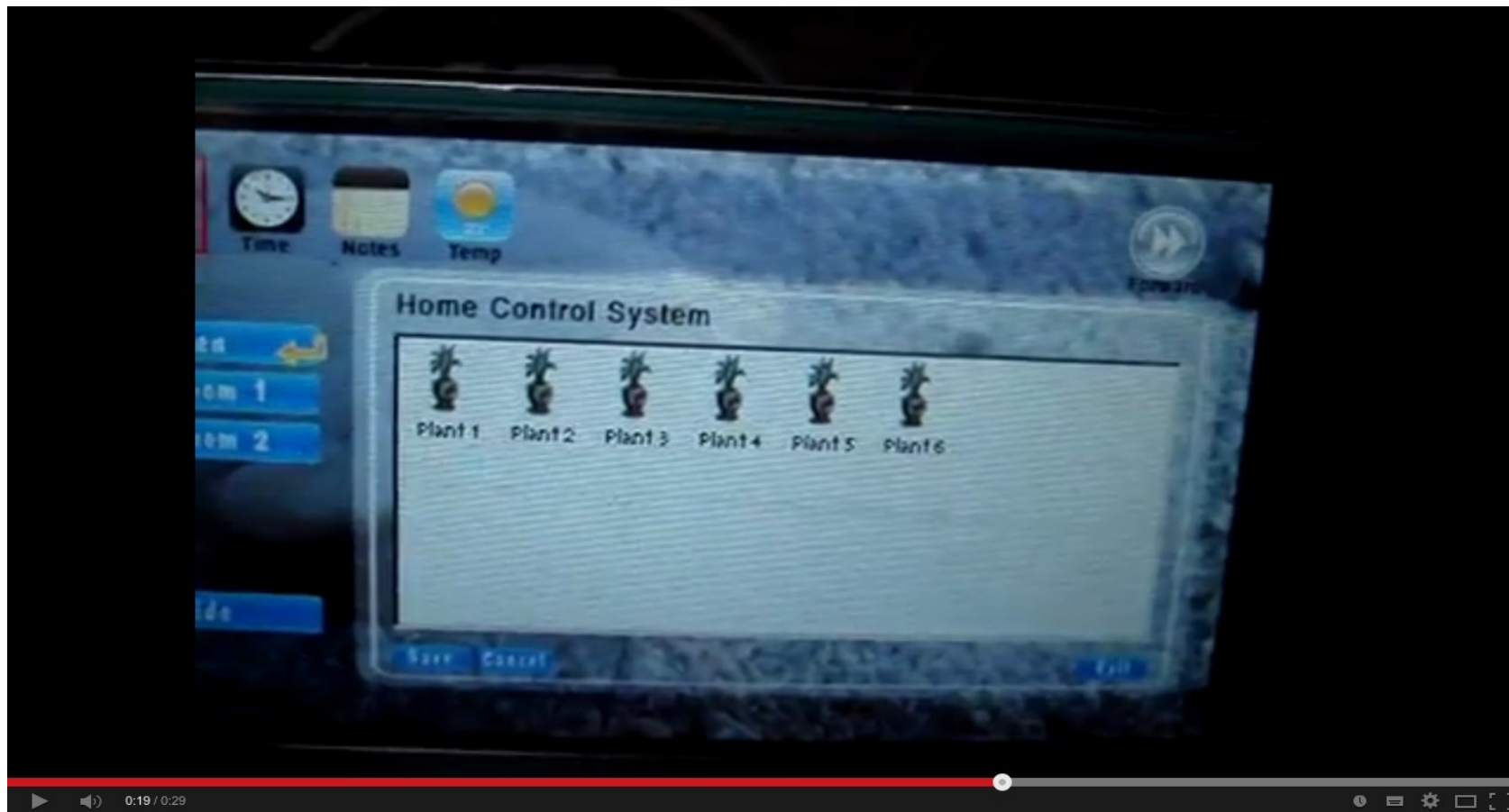
| Curiosity

- Given some more RAM, can we run Qt on a Cortex-M3/M4 utilizing μ Clinux

Linux vs. μ Clinux

- | Special Linux-port for MMU-less devices
- | No MMU \rightarrow no virtual memory
 - Kernel and all processes share the same (physical) address space
 - No contiguous (virtual) memory created from scattered physical pages
 - No (real) `mmap()`
 - Fixed size stacks
 - No `fork()`, only `vfork()`
 - (typically) no shared libraries.
 - ...
- | Still feels like a real Linux
- | A wealth of software
- | Lots of things work out of the box (or after some limited porting effort)

Still curious



Shopping!

- | Emcraft: Freescale Kinetis K70 board
 - 64MB RAM
 - 128MB Flash
 - 150Mhz
- | Includes the demo shown in the video
 - Stripped down Qt4.7
 - Better than expected
 - Actually useable

Qt5

- | How much of Qt can we get? Core, GUI, QtQuick1, ...?
- | No GPU → no QtQuick2

- | Steps to get Qt5.3 working:
 - | Certain features need to be disabled
 - feature-no-process, feature-no-library, ...
 - Not a supported build configuration so various smaller build issues had to be fixed
 - | Very old toolchain (GCC4.4.1)
 - Too old for Qt, more small issues to fix
 - | No libraries means no plugins
 - qpa: linuxfb; input: evdevtouch statically compiled in
 - | Fix the kernel to allow allocations of more than 8MB

Wrap-up

- | It can be done
- | Performance is better than expected
- | Some assembly required
- | Worthwhile?

| Contact

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