

Using EMUL- ARM with Low Speed Targets

EMUL-ARM can now be used with low speed targets (low clock frequency). Also, it is possible to control the JTAG clock when there reasons when the highest possible clock rate is not allowed.

Internally in EMUL-ARM, two algorithms are used to allow communication with slow targets. They can be used together or one at a time:

- “Slow” target access.
- Low JTAG clock frequency.

One of a low speed target example is Atmel AT91M55800A (and many other in the AT91 series), which boot with a clock 32 KHz.

Configuration

On “Config | Emul” following configuration options are related to targets that operate at low speed:

- **Auto Speed at Reset** – allows EMUL-ARM to bring the target up to full speed automatically. (Not implemented for all MCUs.)
- **Slow Target** – a special slow target communication mode is entered. Do not use this unless really necessary, since it will slow down target communication significantly. This does not affect JTAG clock.
- **JTAG Clock (KHz)** – set JTAG clock speed.

The USB/JTAG interface supports JTAG Clock frequencies in the range 11 – 750 KHz. Other Nohau interfaces (i.e. the CTM – Compact Trace Module) may support other frequencies.

Commands

Sometimes it is desired to control communication speed in macros – following commands can be used for that purpose:

- **Cfg_ExternalWait** – same as “Slow Target” in the configuration window, takes parameter “Yes” or “No”.
- **Cfg_ExternalWaitClock** – same as “JTAG Clock (KHz)” in the configuration window, takes a numeric parameter in range “0..1000” (or similar). Setting “0” means as fast as possible.

A reasonable approach is to create macro files for low speed and high speed, and connect those to buttons on the tool bar, and have an initial setting in the emulator configuration.

Auto Detection of JTAG Clock Speed

EMUL-ARM performs an “auto-detection” of maximum JTAG clock speed at Full Reset (which means that it will also be done at startup). At this time, EMUL-ARM will refuse to go higher than detected maximum clock speed, even if configuration suggests to.

However, subsequent JTAG clock modifications do not have this requirement. (Note that some changing some settings in “Config | Emul” cause Full Reset.)

Conflict – Emulator Configuration / Commands

Please note – currently there is a conflict in using Emulator Configuration and Commands, but only **when saving startup.bas manually or at exit** (or other startup macro file being used). In this case, the startup configuration will be determined by last commands sent. This should be a small problem for a problem with the JTAG clock, since it is auto adjusted at startup. However, for the “Slow Target” it must be adjusted manually.

Atmel AT91M55800A

Atmel AT91M55800A is currently the only AT91 MCU we have tested the functionality. For this MCU, it is enough to configure it as a “Slow Target”.

However, please note that when AT91M55800A is used on an evaluation board, such as the EB55, the boot code on board will put it in full speed mode.