Connecting Bare Metal Devices

You can configure build and run kits to use Bare Metal tool chains installed on the development host to build applications for Bare Metal devices. You can connect the devices to the development host to run and debug applications on them from Qt Creator using GDB or a hardware debugger. This enables you to debug on small devices that are not supported by the generic remote Linux device plugin.

> **Note:** If you use qmake to build the project and the device does not have Qt libraries, you need a fake Qt installation.

The following tool chains are supported for building applications:

- GCC: Microchip Technology (AVR, AVR32, PIC16, PIC32), NXP Semiconductors (ColdFire, M68K), Texas Instruments (MSP430), National Semiconductor (CR16C), Renesas Electronics (M32R, M32C, RL78, RX, SuperH, V850), Tensilica XTENSA (ESP8266, ESP32), RISC-V, Arm
- IAR EW: Microchip Technology (AVR, AVR32), NXP Semiconductors (ColdFire, M68K), Texas Instruments (MSP430), National Semiconductor (CR16C), Renesas Electronics (78K, M16/R8C, M32C, R32C, RH850, RL78, RX, SuperH, V850), STMicroelectronics (STM8), 8051, RISC-V, Arm
- Keil: Arm, C51 (8051), C251 (80251), C166 (C16x, XC16x)
- SDCC: STMicroelectronics (STM8), 8051

The bare metal device type accepts custom GDB commands that you specify in the device preferences. You can specify the commands to execute when connecting using a particular debug server provider.

The following debug server providers are supported when using GDB:

- EBlink
- J-Link
- OpenOCD
- ST-Link

ST-Link and J-Link debug server providers can be used together with the uVision IDE.

Enabling the Bare Metal Device Plugin

To enable the Bare Metal Device plugin:

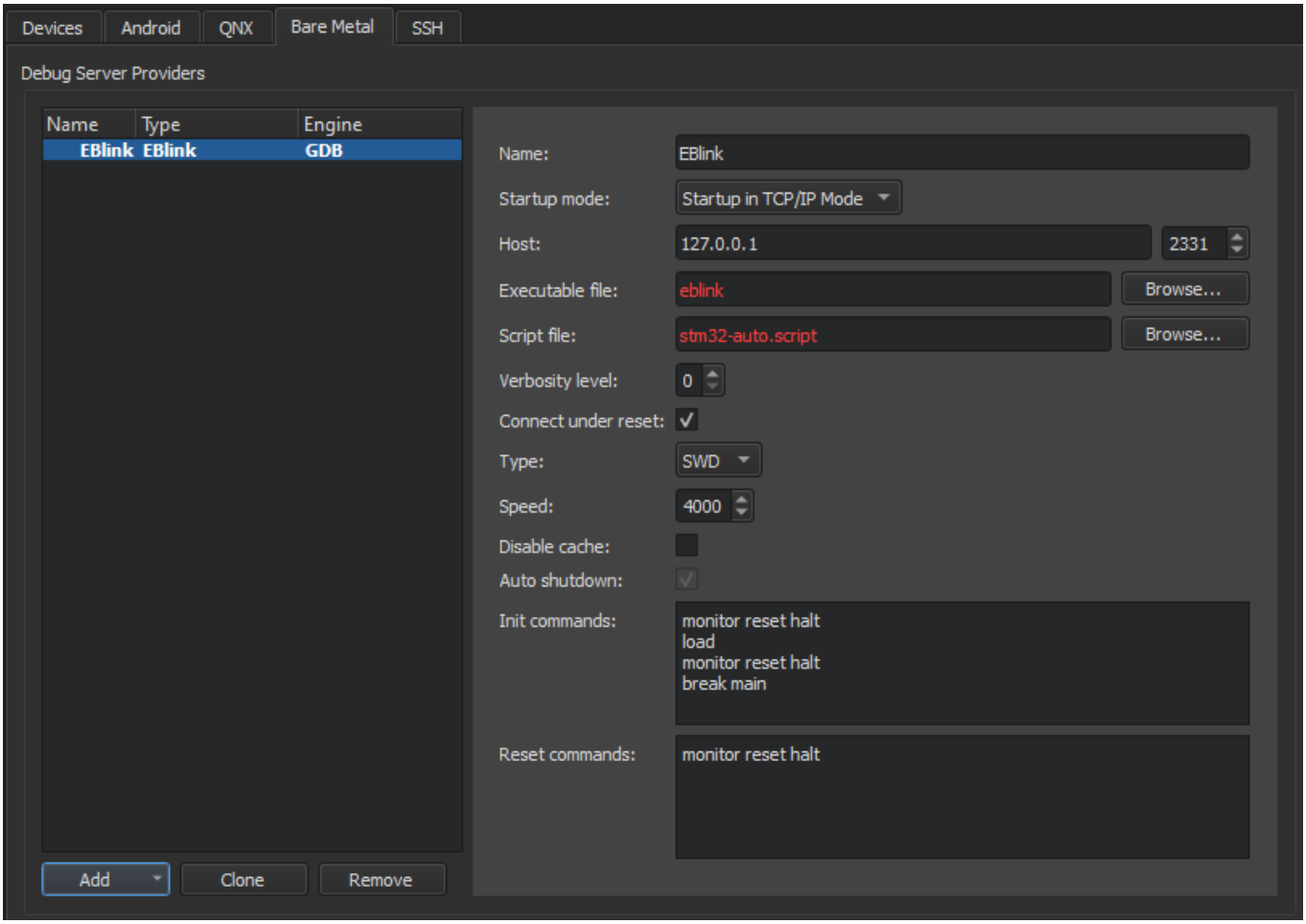
1. Select **Help** > **About Plugins** > **Device Support** > **Bare Metal**.
2. Select **Restart Now** to restart Qt Creator and load the plugin.

Specifying Settings for Debug Server Providers

To create connections to bare metal devices using a debug server provider, select **Edit** > **Preferences** > **Devices** > **Bare Metal** > **Add** > **Default**. The available settings depend on the debug server provider.

EBlink

EBlink is an ARM Cortex-M debug tool that supports squirrel scripting, live variables, and hot-plugging.

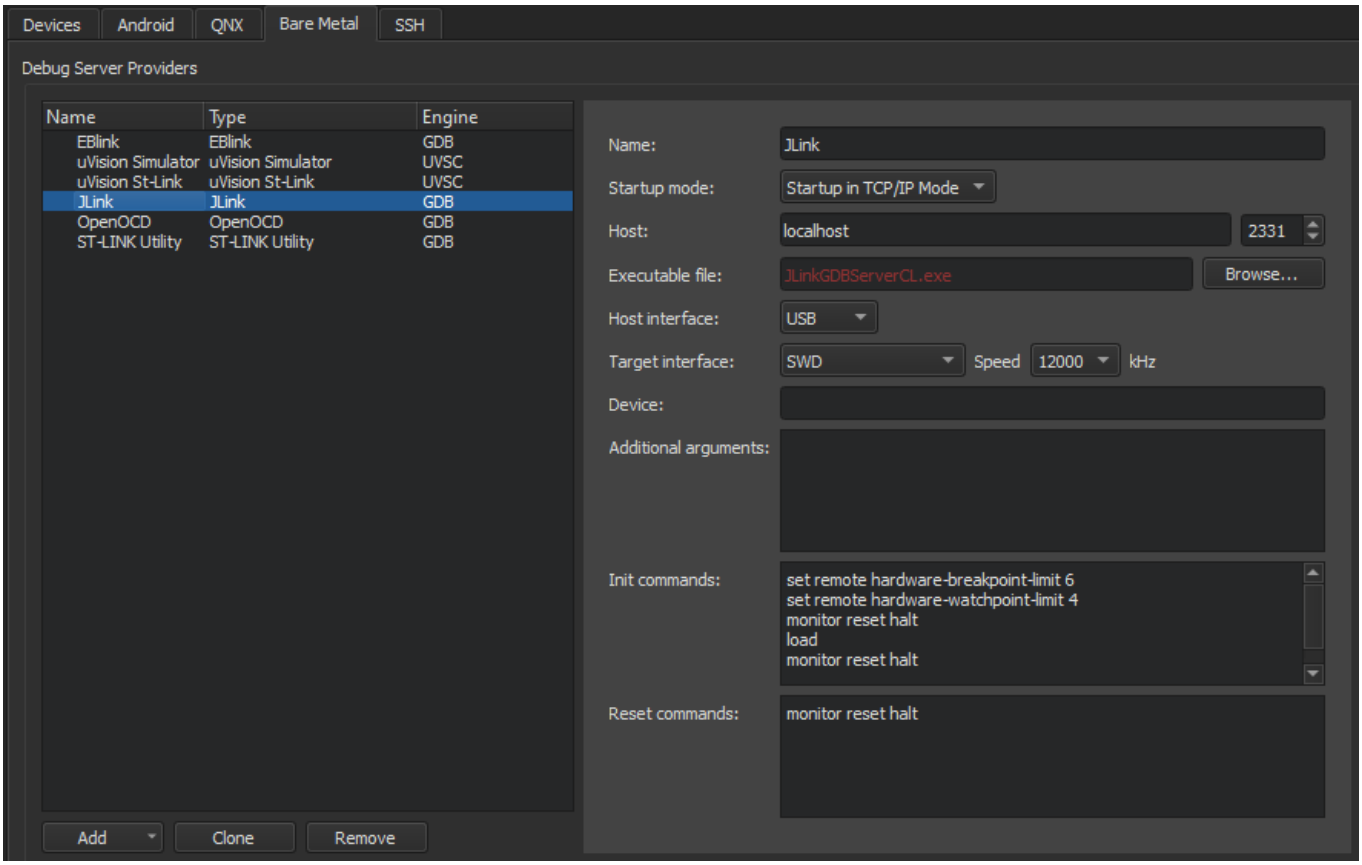


To specify settings for EBlink:

1. In the **Name** field, enter a name for the connection.
2. In the **Startup mode** field, select the mode to start the debug server provider in.
3. In the **Host** field, select the host name and port number to connect to the debug server provider.
4. In the **Executable file** field, enter the path to the debug server provider executable.
5. In the **Script file** field, enter the path to a device script file.
6. In the **Verbosity level** field, enter the level of verbose logging.
7. Select the **Connect under reset** check box to use the ST-Link interface. Deselect the check box for hot-plugging.
8. In the **Type** field, select the interface type.
9. In the **Speed** field, enter the interface speed between 120 and 8000 kiloherz (kHz).
10. Select the **Disable cache** check box to disable the EBlink flash cache.
11. Select the **Auto shutdown** check box to automatically shut down the EBlink server after disconnecting.
12. In the **Init commands** field, enter the commands to execute when initializing the connection

J-Link

J-Link is a line of debug probes by Segger.

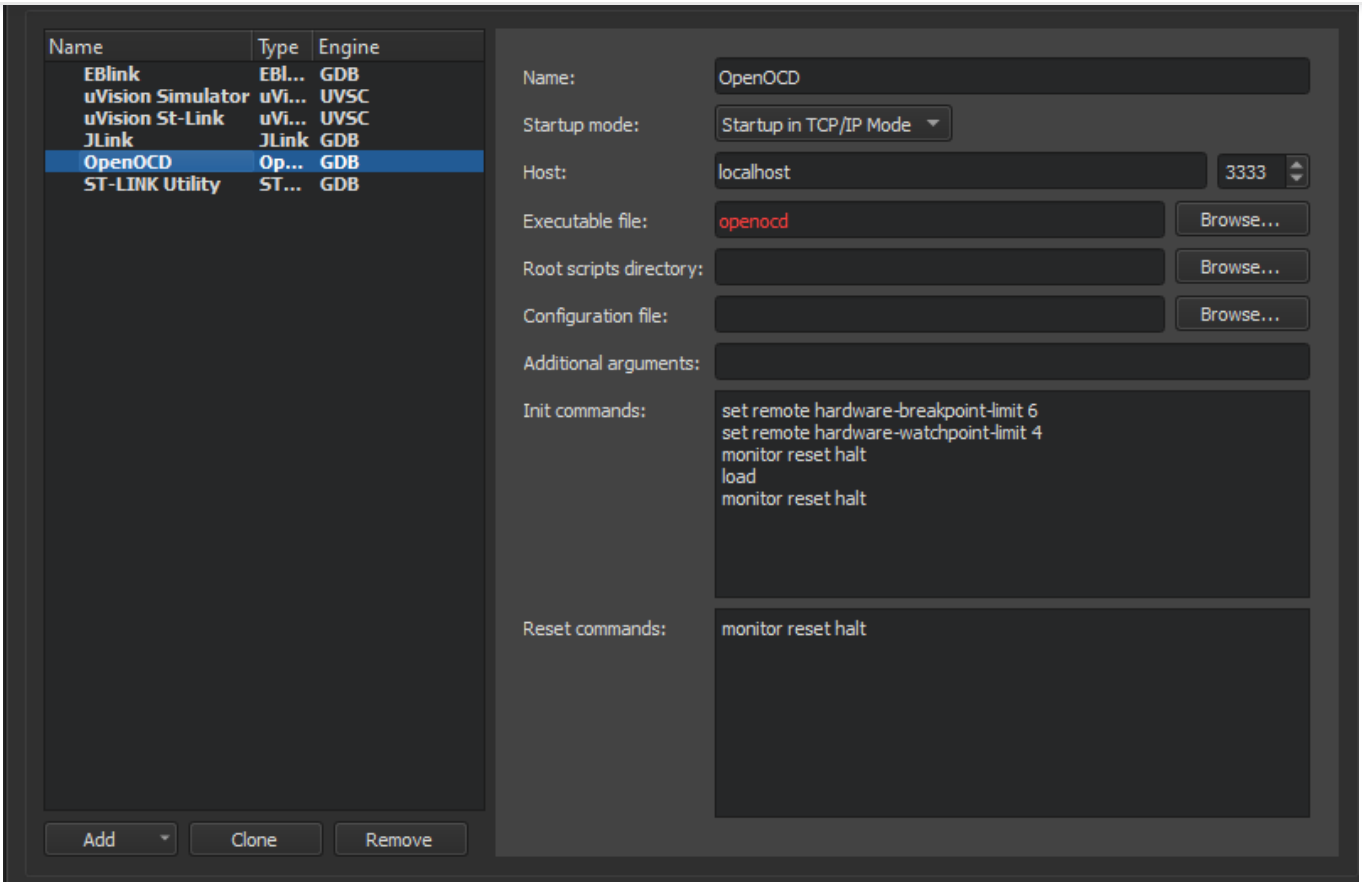


To specify settings for J-Link debug probes:

1. In the **Name** field, enter a name for the connection.
2. In the **Startup mode** field, select the mode to start the debug server provider in.
3. In the **Host** field, select the host name and port number to connect to the debug server provider.
4. In the **Executable file** field, enter the path to the debug server provider executable.
5. In the **Host interface** field, select the connection type, IP or USB, or use the default connection.
6. In the **Target interface** field, select the target interface type.
7. In the **Speed** field, enter the interface speed in kHz.
8. In the **Device** field, select the device to connect to.
9. In the **Additional arguments** field, enter arguments for the commands.
10. In the **Init commands** field, enter the commands to execute when initializing the connection.
11. In the **Reset commands** field, enter the commands to execute when resetting the connection.
12. Select **Apply** to add the debug server provider.

OpenOCD

OpenOCD (Open On-Chip Debugger) is an on-chip debug solution for targets based on the ARM7 and ARM9 family with Embedded-ICE (JTAG) facility. It enables source level debugging with the GDB compiled for the ARM architecture.

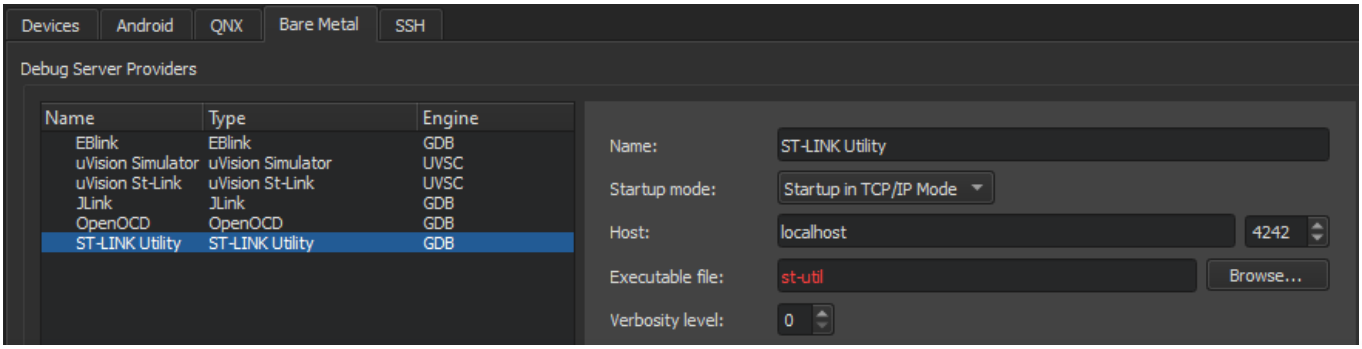


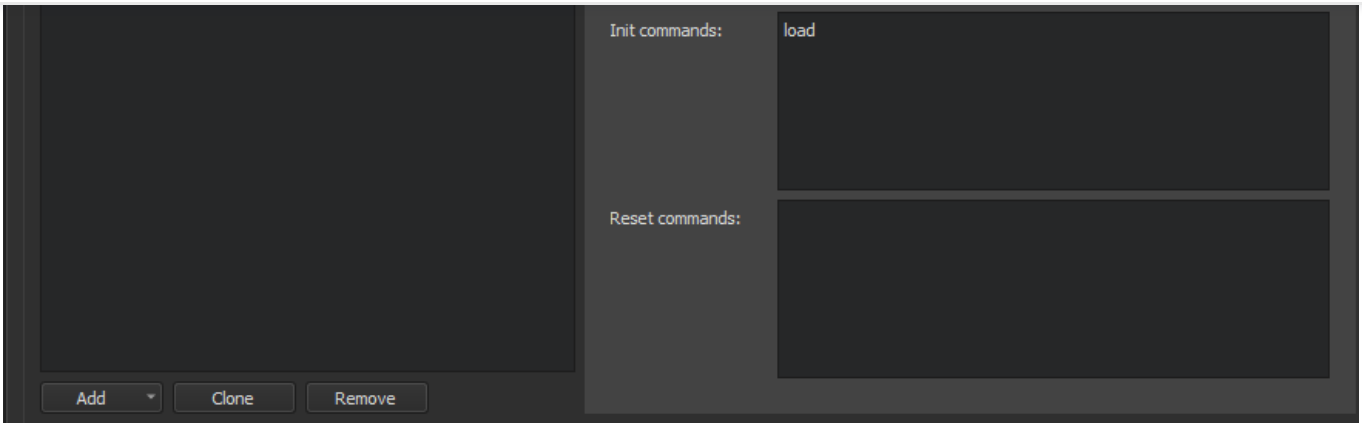
To specify settings for OpenOCD:

1. In the **Name** field, enter a name for the connection.
2. In the **Startup mode** field, select the mode to start the debug server provider in.
3. In the **Host** field, select the host name and port number to connect to the debug server provider.
4. In the **Executable file** field, enter the path to the debug server provider executable.
5. In the **Root scripts directory** field, enter the path to the directory that contains configuration scripts.
6. In the **Configuration file** field, enter the path to the device configuration file.
7. In the **Additional arguments** field, enter arguments for the commands.
8. In the **Init commands** field, enter the commands to execute when initializing the connection.
9. In the **Reset commands** field, enter the commands to execute when resetting the connection.
10. Select **Apply** to add the debug server provider.

St-Link

ST-LINK Utility is used for programming STM32 microcontrollers.





To specify settings for St-Link:

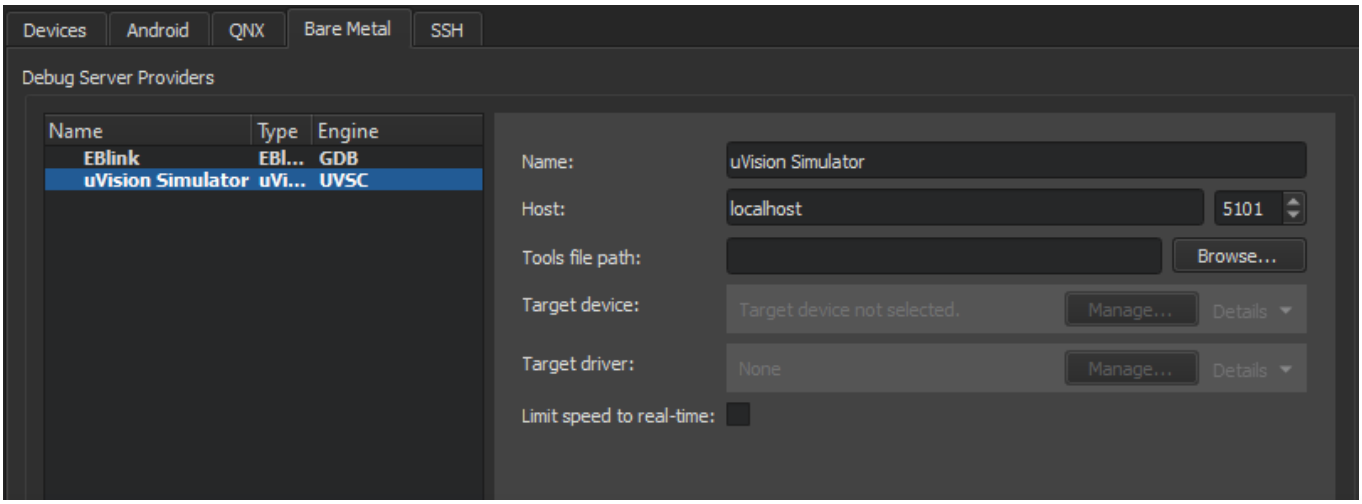
1. In the **Name** field, enter a name for the connection.
2. In the **Startup mode** field, select the mode to start the debug server provider in.
3. In the **Host** field, select the host name and port number to connect to the debug server provider.
4. In the **Executable file** field, enter the path to the debug server provider executable.
5. In the **Verbosity level** field, enter the level of verbose logging.
6. Select the **Extended mode** check box to continue listening for connection requests after after the connection is closed.
7. Select the **Reset on connection** check box to reset the board when the connection is created.
8. In the **Version** field, select the transport layer type supported by the device.
9. In the **Init commands** field, enter the commands to execute when initializing the connection.
10. In the **Reset commands** field, enter the commands to execute when resetting the connection.
11. Select **Apply** to add the debug server provider.

uVision IDE

uVision is an IDE for developing applications for embedded devices. Applications can be debugged by using uVision Simulator or directly on hardware by using St-Link and J-Link.

You can view the current state of peripheral registers in the **Peripheral Registers** view in Debug mode. The view is hidden by default.

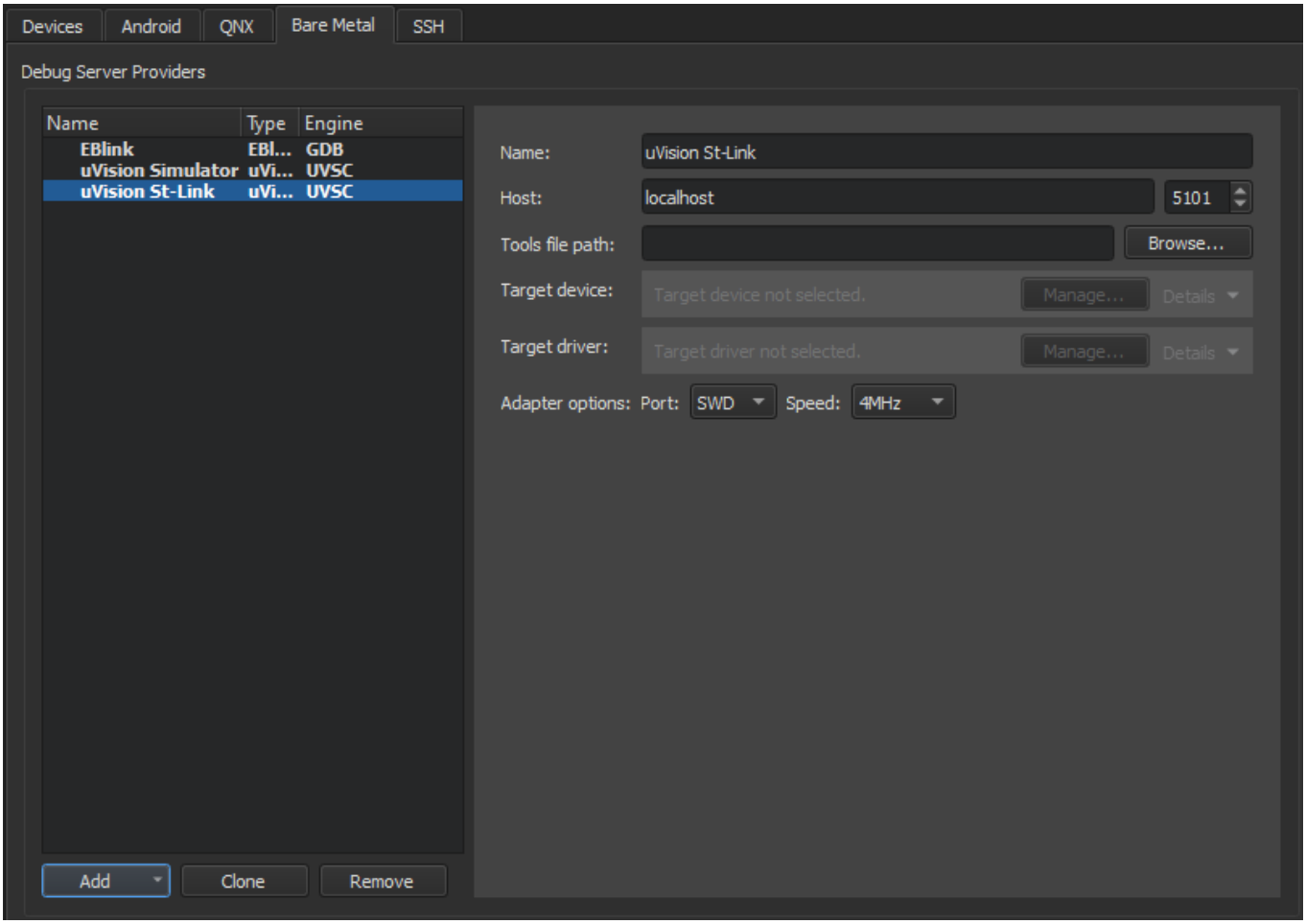
uVision Simulator



To specify settings for uVision Simulator or uVision St-Link Debugger:

1. In the **Name** field, enter a name for the connection.
2. In the **Host** field, select the host name and port number to connect to the debug server provider.
3. In the **Tools file path** field, enter the path to the Keil toolset configuration file.
4. In the **Target device** field, select the device to debug.
5. In the **Target driver** field, select the driver for connecting to the target device.
6. Select the **Limit speed to real-time** check box to limit the connection speed.
7. Select **Apply** to add the debug server provider.

uVision St-Link Debugger

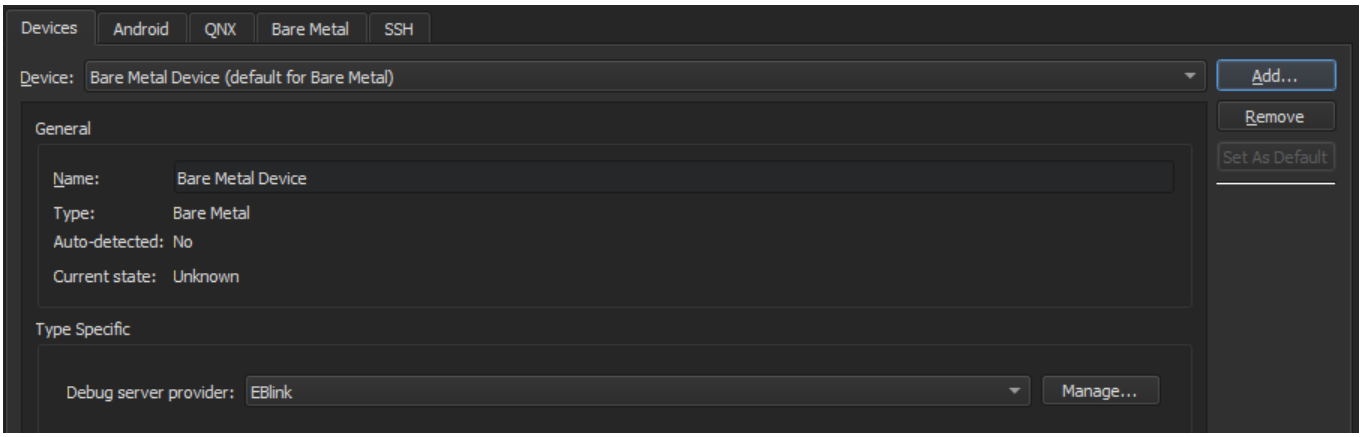


To specify settings for uVision St-Link Debugger:

1. In the **Name** field, enter a name for the connection.

4. In the **Target device** field, select the device to debug.
5. In the **Target driver** field, select the driver for connecting to the target device.
6. In the **Adapter options** field specify the adapter interface type and speed in MHz.
7. Select **Apply** to add the debug server provider.

Adding Bare Metal Devices

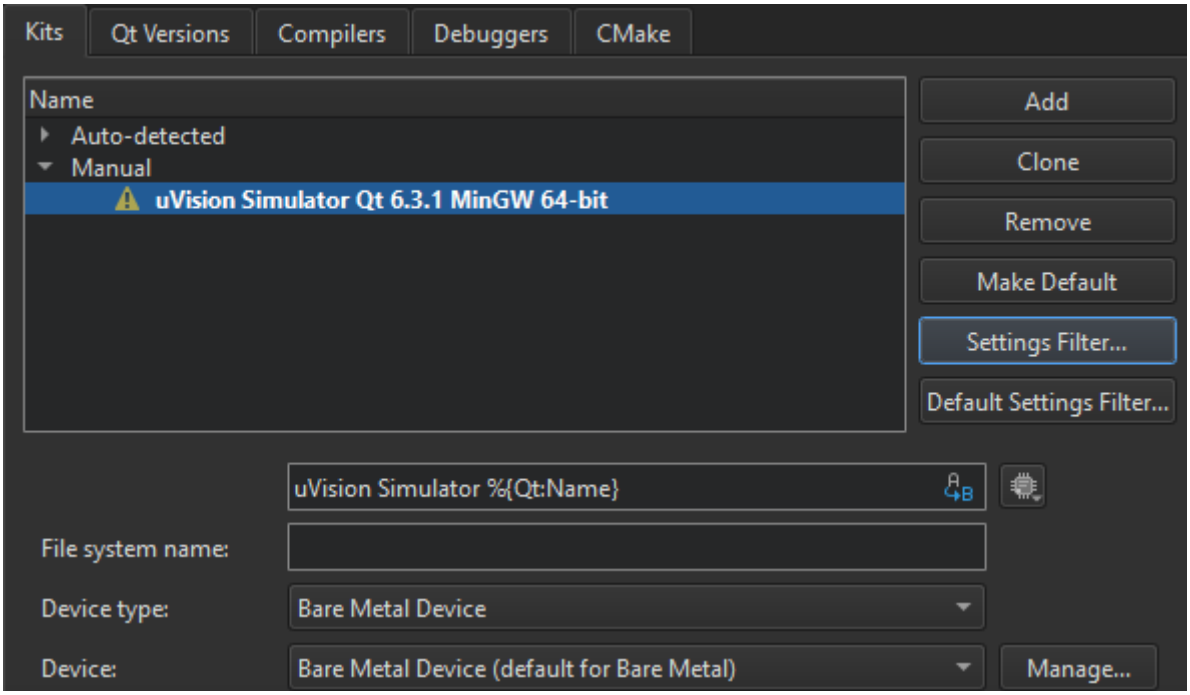


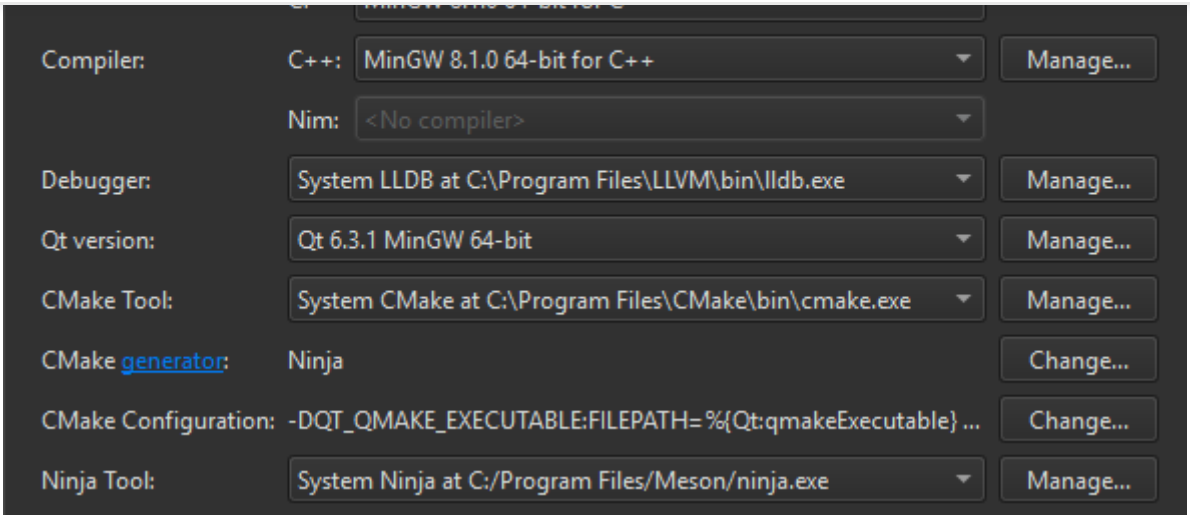
To add a bare metal device:

1. Select **Edit** > **Preferences** > **Devices** > **Add** > **Bare Metal Device** > **Start Wizard**.
2. In the **Debug server provider** field, select a debug server provider.
3. Select **Apply** to add the device.

Building for and Running on Bare Metal Devices

To add a kit for building applications and running them on bare metal devices, select **Edit** > **Preferences** > **Kits** > **Add**. For more information, see Adding Kits.





You can build applications for and run them on bare metal devices in the same way as for and on the desktop. For more information, see Building for Multiple Platforms and Running on Multiple Platforms.

‹ Connecting Android Devices

Connecting Boot2Qt Devices ›