

mikroBUS Driver for Add-on Boards

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mikroBUS is an add-on board socket standard by MikroElektronika that can be freely used by anyone following the guidelines. The mikroBUS standard includes SPI, I2C, UART, PWM, ADC, GPIO and power (3.3V and 5V) connections to interface common embedded peripherals, there are more than 800 add-on boards ranging from wireless connectivity boards to human-machine interface sensors which conform to the mikroBUS standard, out of which more than 140 boards already have device driver support in the Linux kernel. Today, the most straight forward method for loading these device drivers is to provide device-tree overlay fragments at boot time which needs maintaining a huge out-of-tree repository of device tree fragments for each add-on board for each supported socket for each target, moreover device-tree currently does not support instantiating devices on dynamically created greybus peripherals.

mikroBUS driver is introduced in the kernel to solve the problem by enabling mikroBUS as a probeable bus such that the kernel can discover the device(s) on the bus at probe time, this is done by storing the add-on board device driver-specific information on a non-volatile storage accessible over 1-wire on the mikroBUS port. The format for describing the device driver-specific information is an extension to the Greybus manifest. In addition to physical mikroBUS ports on a target, the driver also supports instantiation of devices on remote mikroBUS port(s) on a micro-controller which is visible to the host as a set of greybus peripherals. The choice of greybus manifest for device description makes sure that only one kind of device description is required independent of the way in which the device is connected to the host. The mikroBUS driver does not have any strict associations to the pin mapping of the port and the same framework can be reused for other similar add-on board standards such as FeatherWing, PMOD, Grove or Qwiic. With more than 140 add-on boards having tested support today, the mikroBUS driver helps to reduce the time to develop and debug various add-on boards and support for greybus enables rapid prototyping and deployment of remote systems.

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