Kernel driver zl6100

Supported chips:

- Renesas / Intersil / Zilker Labs ZL2004

  Prefix: 'zl2004'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl2004-datasheet.pdf
- Renesas / Intersil / Zilker Labs ZL2005

  Prefix: 'zl2005'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl2005-datasheet.pdf
- Renesas / Intersil / Zilker Labs ZL2006

  Prefix: 'zl2006'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl2006-datasheet.pdf
- Renesas / Intersil / Zilker Labs ZL2008

  Prefix: 'zl2008'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl2008-datasheet.pdf
- Renesas / Intersil / Zilker Labs ZL2105

  Prefix: 'zl2105'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl2105-datasheet.pdf
- Renesas / Intersil / Zilker Labs ZL2106

  Prefix: 'zl2106'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl2106-datasheet.pdf
- Renesas / Intersil / Zilker Labs ZL6100

  Prefix: 'zl6100'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl6100-datasheet.pdf
- Renesas / Intersil / Zilker Labs ZL6105

  Prefix: 'zl6105'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl6105-datasheet.pdf
- Renesas / Intersil / Zilker Labs ZL8802

  Prefix: 'zl8802'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl8802-datasheet
- Renesas / Intersil / Zilker Labs ZL9101M

  Prefix: 'zl9101'

  Addresses scanned: -

  Datasheet: https://www.renesas.com/us/en/document/dst/zl9101m-datasheet
- Renesas / Intersil / Zilker Labs ZL9117M

  Prefix: 'zl9117'

Addresses scanned: -

Datasheet: https://www.renesas.com/us/en/document/dst/zl9117m-datasheet

- Renesas / Intersil / Zilker Labs ZLS1003, ZLS4009

  Prefix: 'zls1003', zls4009

  Addresses scanned: -

  Datasheet: Not published

- Flex BMR450, BMR451

  Prefix: 'bmr450', 'bmr451'

  Addresses scanned: -

  Datasheet:

https://flexpowermodules.com/resources/fpm-techspec-bmr450-digital-pol-regulators-20a

- Flex BMR462, BMR463, BMR464

  Prefixes: 'bmr462', 'bmr463', 'bmr464'

  Addresses scanned: -

  Datasheet: https://flexpowermodules.com/resources/fpm-techspec-bmr462

- Flex BMR465, BMR467

  Prefixes: 'bmr465', 'bmr467'

  Addresses scanned: -

  Datasheet: https://flexpowermodules.com/resources/fpm-techspec-bmr465-digital-pol

- Flex BMR466

  Prefixes: 'bmr466'

  Addresses scanned: -

  Datasheet: https://flexpowermodules.com/resources/fpm-techspec-bmr466-8x12

- Flex BMR469

  Prefixes: 'bmr469'

  Addresses scanned: -

  Datasheet: https://flexpowermodules.com/resources/fpm-techspec-bmr4696001

Author: Guenter Roeck <linux@roeck-us.net>

Description

This driver supports hardware monitoring for Renesas / Intersil / Zilker Labs ZL6100 and compatible digital DC-DC controllers.

The driver is a client driver to the core PMBus driver. Please see Documentation/hwmon/pmbus.rst and Documentation.hwmon/pmbus-core for details on PMBus client drivers.

Usage Notes

This driver does not auto-detect devices. You will have to instantiate the devices explicitly. Please see Documentation/i2c/instantiating-devices.rst for details.

> **Warning**
>
> Do not access chip registers using the i2cdump command, and do not use any of the i2ctools commands on a command register used to save and restore configuration data (0x11, 0x12, 0x15, 0x16, and 0xf4). The chips supported by this driver interpret any access to those command registers (including read commands) as request to execute the command in question. Unless write accesses to those registers are protected, this may result in power loss, board resets, and/or Flash corruption. Worst case, your board may turn into a brick.

Platform data support

The driver supports standard PMBus driver platform data.

Module parameters

Module parameters

delay

Renesas/Intersil/Zilker Labs DC-DC controllers require a minimum interval between I2C bus accesses. According to Intersil, the minimum interval is 2 ms, though 1 ms appears to be sufficient and has not caused any problems in testing. The problem is known to affect all currently supported chips. For manual override, the driver provides a writeable module parameter, 'delay', which can be used to set the interval to a value between 0 and 65,535 microseconds.

Sysfs entries

The following attributes are supported. Limits are read-write; all other attributes are read-only.

in1_label	"vin"
in1_input	Measured input voltage.
in1_min	Minimum input voltage.
in1_max	Maximum input voltage.
in1_lcrit	Critical minimum input voltage.
in1_crit	Critical maximum input voltage.
in1_min_alarm	Input voltage low alarm.
in1_max_alarm	Input voltage high alarm.
in1_lcrit_alarm	Input voltage critical low alarm.
in1_crit_alarm	Input voltage critical high alarm.
in2_label	"vmon"
in2_input	Measured voltage on VMON (ZL2004) or VDRV (ZL9101M, ZL9117M) pin. Reported voltage is 16x the voltage on the pin (adjusted internally by the chip).
in2_lcrit	Critical minimum VMON/VDRV Voltage.
in2_crit	Critical maximum VMON/VDRV voltage.
in2_lcrit_alarm	VMON/VDRV voltage critical low alarm.
in2_crit_alarm	VMON/VDRV voltage critical high alarm. vmon attributes are supported on ZL2004, ZL8802, ZL9101M, ZL9117M and ZLS4009 only.
inX_label	"vout[12]"
inX_input	Measured output voltage.
inX_lcrit	Critical minimum output Voltage.
inX_crit	Critical maximum output voltage.
inX_lcrit_alarm	Critical output voltage critical low alarm.
inX_crit_alarm	Critical output voltage critical high alarm. X is 3 for ZL2004, ZL9101M, and ZL9117M, 3, 4 for ZL8802 and 2 otherwise.
curr1_label	"iin"
curr1_input	Measured input current. iin attributes are supported on ZL8802 only
currY_label	"iout[12]"
currY_input	Measured output current.
currY_lcrit	Critical minimum output current.
currY_crit	Critical maximum output current.
currY_lcrit_alarm	Output current critical low alarm.
currY_crit_alarm	Output current critical high alarm. Y is 2, 3 for ZL8802, 1 otherwise
temp[12]_input	Measured temperature.
temp[12]_min	Minimum temperature.
temp[12]_max	Maximum temperature.
temp[12]_lcrit	Critical low temperature.
temp[12]_crit	Critical high temperature.
temp[12]_min_alarm	Chip temperature low alarm.
temp[12]_max_alarm	Chip temperature high alarm.
temp[12]_lcrit_alarm	Chip temperature critical low alarm.
temp[12]_crit_alarm	Chip temperature critical high alarm.