NAME

  ow_temp - Dallas Semiconductor 1-Wire Temperature sensor

SYNOPSIS

  device ow_temp

DESCRIPTION

  The **ow_temp** module supports many of the 1-Wire temperature sensors.

  The sensor is read periodically and the results returned via a sysctl(3) as described below.

HARDWARE

  These temperature sensors are supported by the **ow_temp** driver:

  DS1820   1-Wire Digital Thermometer
  DS18S20   High-Precision 1-Wire Digital Thermometer
  DS18B20   Programmable Resolution 1-Wire Digital Thermometer
  DS1822   Econo 1-Wire Digital Thermometer
  DS1825   Programmable Resolution 1-Wire Digital Thermometer with 4-bit ID
  MAX31820 1-Wire, Parasite-Power, Ambient Temperature Sensor

  The driver supports Family codes 0x10, 0x22, 0x28, and 0x3b.

SYSCTL

  The **ow_temp** driver reports data via sysctl(8) entries in the device's node in the sysctl(8) tree:

  temperature   The last temperature read, in milli-Kelvin.

  badcrc   The number of CRC errors in reading the temperature form the device. Some CRC errors
                are to be expected. High rates of CRC errors, however, generally indicate a noisy
                environment, cabling issues, or too many devices on the bus.

  badread   The number of times a non-CRC error was encountered reading the temperature from the
                card. This type of error is very rare.

  reading_interval
                The time, in ticks, between successive reads of the sensor.

  parasite   This item is non-zero when the device is connected using its parasitic power mode. It can
                also indicate a wiring error.

Temperatures are reported in milli-Kelvin, even though the absolute accuracy is around 0.2 degrees for the good devices and around 1 degree for cheaper devices. The devices report in steps of 0.0625 degrees. The driver preserves the precision of the device's measurements in its sysctl(8) reports. These devices often have a much higher relative accuracy and repeatability than their absolute accuracy. This makes them well suited for control loops that strive for stability and become possible if the full precision is preserved.

SEE ALSO

ow(4), owc(4), sysctl(8), owll(9), own(9)

LEGAL

1-Wire is a registered trademark of Maxim Integrated Products, Inc.

HISTORY

The **ow_temp** driver first appeared in FreeBSD 11.0.

AUTHORS

The **ow_temp** device driver and this manual page were written by Warner Losh.

BUGS

The parasitic mode of the devices does not work. It requires support from the owc(4) driver that is unimplemented.

The ID bits from the *DS1825* are not recognized or reported.

The type of the device is not reported via sysctl(8).

Alarm mode is not supported. It is not possible to set the low and high alarm temperatures.

There is no way to write to the EEPROM.

"Convert Temperature" requests are sent directly to the device. There is no way to use the broadcast ability of the 1-Wire bus to do all the conversions in parallel.

It is not possible to set the precision on those devices that support it.

The time to convert is fixed at 1 second, even though some devices are faster.

There is no character device to supply a stream of readings to a program. Programs interested in the temperature must poll the sysctl to get the temperature.