

Intelligent RS232 -> 1Wire Gateway

There is no defined limit on the number of sensors that are supported. There is obviously a limit to how many sensors can be reported in a finite amount of time, however, there is no software restriction on the number of sensors.

Features

AutoReporting ...

Report on a timed basis without action from the host.
The period between reports is user specified in 0.1 seconds.
The period has a range of 1-65535 (0.1 seconds to 109.225 minutes)

TOD Clock ... A Time of Day (TOD) Clock is provided.

The TOD clock is adjustable to achieve greater accuracy under field conditions. Note: there is no battery backup for the TOD clock. If the Module resets or is power cycled, the TOD clock will reset to 00:00:00.0

Persistent Settings ... Many settings are non-volatile.

Examples of persistent settings are:
Serial baud rate
Time Stamping on/off
Auto Reporting Period
Auto Reporting on/off

ASCII Commands/Reports ...

Only ASCII commands are necessary to communicate with and retrieve data from the module.

Field Upgradeable ...

Additional sensors can be added at any time.
Issue the inventory command ("I") and the new sensor will be discovered. If Auto Reporting is active, the new sensor will be discovered on the next AutoReport cycle.

Installation

The module attaches to your computer on a serial COM port. Locate an unused COM port and attach the module to the male DB9 connector. Connect the sensors to the module using standard Cat5 cables.

Note: while the same cable type is used as for Ethernet, do not plug your sensors or the module into your Ethernet LAN. It simply won't work. It won't break, however, it won't work.

The module steals power from the serial port (COM port). The amount of power the serial port supplies may limit the number of sensors you can deploy.

Each sensor has a unique serial number associated with it. It is best to plug your sensors in one at a time and perform an inventory ("I") command. You should document which serial number was just added. Later on, you will probably want to associate the serial number with a physical location in your documentation.

Command Descriptions

A . . . Set Auto-Report Period

Supply a decimal number between 1-65535 followed by <Cr>
 The units are 0.1 seconds.
 Example: A1200 would specify an AutoReport Period of
 2 minutes (1200 x 0.1 seconds = 120 seconds)

C . . . Set Time of Day (TOD) Clock

Supply an ASCII string in the form HH:MM:SS.T followed by <Cr>.
 HH = Hours (0-23)
 MM = Minutes (0-59)
 SS = Seconds (0-59)
 T = Tenths of Seconds

If only some of the parameters are supplied, the missing parameters will be set to zero. Example:
 c21:45:19.6 sets the TOD clock to 21:45:19.6
 c21:45 sets the TOD clock to 21:45:00.0

D . . . Report current Sensor Data

The sensors are converted and the data is reported.
 The data report is:

Xxxxxxxxxxxxxxxxxx ss,ccc.cc,fff.ff,hhh CrLf

xxxxxxxxxxxxxxxx is the OW serial number of the sensor.

ss is the Sensor type

ccc.cc is Temperature in degrees Centigrade (1/32 degree precision).

fff.ff is Temperature in degrees Fahrenheit (1/32 degree precision)

hhh is Humidity in % Relative Humidity (Only reported for temp/humidity combo sensor)

If Time-Stamping is enabled (See S command), the data report will be followed by the current TOD clock value. After the last sensor data line has been displayed, a line containing EOD<Cr><Lf> will be transmitted.

Sensor 1 is a 18S20 (Family code 10)

Sensors 4 is a 18B20's (Family code 28)

Sensor 5 is a temp/hum combo (Family code 26). Note: Humidity is reported in field 4.

TimeStamping Off example

28EF283F00000007,24.31,75.75

264043150000000A 19,23.31,73.96,39

EOD

TimeStamping On example

28EF283F00000007,24.31,75.75,00:09:55.8

264043150000000A 19,23.31,73.96,39,00:09:55.9

EOD

d . . . Restore Factory Defaults

All persistent settings are returned to the factory defaults. Module is then restarted.

E . . . Echo on

Characters received by the Module are echoed back.

e . . . Echo off (default)

Characters received by the Module are not echoed back.

c . . . Adjust TOD clock Faster/Slower

The TOD clock uses a counter of 625,000 ticks per second.

The "c-" command will reduce that value by 10.

The "c+" command will increase that value by 10.

If your Time of Day clock runs slow (loses time), use the c+ command.

Conversely, if your Time of Day clock runs fast (gains time), use the c- Command to adjust the clock.

I . . . Report Sensor Inventory

The Module will display an inventory of all sensors on the One Wire bus and report the serial numbers of each sensor discovered.

Example output:
28EF283F00000007
264043150000000A
EOD

Number of Temp/Hum Sensors: 1
Number of 18x20 sensors: 1
EOD

K ... Tuning Knobs

The Knob (K) command has the general format of Kxxy where:

xx is a two digit hexadecimal knob number.

yy is the value associated with the tuning knob.

All Hexadecimal value MUST be supplied in UPPER CASE.

Knob 07 = Define Sensor type. The Temp/Hum sensors contain a DS2438 chip. Module uses byte 0 of memory page 3 to determine the sensor type. Use this knob to change the sensor type. The format of the K07 command is:

K07xxxxxxxxxxxxxxxxSS where xxx...xxx is the serial number of the DS2438 and SS is the sensor type in Hex. The current sensor types are:

00 ... Temperature only
19 ... Temperature and Humidity
1A ... Temperature and Voltage

R . . . Report Individual Sensor data

Supply the 16 digit One Wire address of the sensor.

Example:

R10B1D56300080029 would return the data for the DS18S20 sensor with an address of 10B1D56300080029

The data returned will depend on the sensor type.

S . . . Time Stamp On

Turn Time Stamping on for commands D,T,H and AutoReport

s . . . Time Stamp Off

Turn Time Stamping OFF for commands D,T,H, and AutoReport

.(Period) . . . 9600 Baud (default)

Set the Module serial interface to 9600 baud, 8 bit, no parity

The change is immediate and persistent.

, (Comma) . . . 19200 Baud

Set the Module serial interface to 19200, 8 bit, no parity.

The change is immediate and persistent.

` (Back Tic) . . . 38400 Baud

Set the Module serial interface to 38400, 8 bit, no parity.

The change is immediate and persistent.

^ (Hat) . . . 57600 Baud

Set the Module serial interface to 57600, 8 bit, no parity.

The change is immediate and persistent.

Overview of Commands:

A=Set AutoReport Period (Default=2 minutes)
B=AutoReport On
b=AutoReport OFF (default)
C=Set TOD Clock (HH:MM:SS.T)
c=Adjust TOD clock rate (+-)
D=Report ALL Module data
d=Reset to factory defaults
E=Echo On
e=Echo Off (default)
I=Report Sensor Inventory
K=Set Sensor Tuning Knob
k=Report Sensor Tuning Knob
R=Report Sensor (OW address)
S=AutoReport Time Stamp On
s=AutoReport Time Stamp Off (default)
T=Report Time of Day
, =19200 Baud
` =38400 Baud
^ =57600 Baud
. =9600 Baud (default)
!=Dump Ram and Restart

Appendix A – Error Messages

All error messages are of the form xx – yyyyyy...yyyyyy Where:

xx is a two digit error number

yyyyyy.....yyyyyy is English text describing the error.

The error messages which might be issued by Module are:

- ?01 - No sensor present.
- ?02 - Invalid hex digit encountered
- ?03 - Invalid decimal digit encountered
- ?04 - CRC8 error
- ?05 - CRC16 error
- ?07 - 1-Wire Bus shorted
- ?08 - 1-Wire Bus scan error

Appendix B ... Debugging Hints

Module is returning “garbage” on the serial interface.

This is one of the most common problems. It is most likely caused by a mismatch between the Module serial baud rate and your computer COM port. The Module allows you to set the startup baud rate. If this has been set (say to 57600 baud) and you forget and connect to the Module at 9600 baud ... the result is “garbage” on the screen. Sending a “break” character to the Module will temporarily change the baud rate to 9600. This change is NOT persistent.

Temp/Humidity Sensor is returning the wrong data types:

This is caused by the sensor type variable inside the Sensor being set incorrectly. For example: If you have a Temp/Humidity Sensor and the sensor type is set to zero, Module will report data for a Temp Only sensor. Use Knob 07 to set the sensor type to 19 for a Temp/Humidity Sensor).

Measuring the voltage of the OW bus:

Set the sensor type of the last (physically) Sensor to 1A (temp & voltage). Now it will report the voltage of the OW-Bus at the far end. The voltage is reported in 10 millivolts. If the bus is lower than 4 volts, certain sensors will not work (in particular the humidity sensor which reports 0% humidity if the supply voltage is less than 4.0 volts)

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DataNab LLC • 1.888.7.DATANAB • 612.486.8974 fax
www.datanab.com