**SunTouch / QuickTouch RS-485 Bus Protocol**

**(SunTouch Firmware Version 2.070)**

**Message format**

Messages consist of seven fields, as shown below. The length of a message can vary from 10 to 265 bytes, depending on the length of the DATA field.

HEADER 4 bytes: 0x00 0xFF 0xA5 0x01

DESTINATION 1 byte destination identifier

COMMAND 1 byte command code

DATA LENGTH 1 byte unsigned int data length (in bytes)

DATA Length as specified by previous byte.Interpretation varies

by command.

CHECKSUM 2 bytes: high-order byte followed by low order byte. The

checksum is calculated by summing all the byte in the

message, starting on the second byte of the HEADER (0xA5)

and ending with the last byte of the DATA. Any overflow is

ignored (i.e., the checksum calculated mod 216).

**Source and Destination Identifiers**

SRC DST

=== ===

Periodic status message: 0f 10

Remote layout request: 10 48

Remote layout response 0f 10

Circuit state change request: 10 48

Circuit state change response: 48 10

It can be seen from the above table that the source and destination identifiers aren’t used very consistently. The SunTouch (controller) can be 0f or 48. When 10 is used as a source, it’s the QuickTouch transceiver. When it’s used as a destination, it’s either the QuickTouch transceiver or (in the case of periodic status messages), anyone who cares.

**Command Code Ox02 - System Status Message**

This message is sent every 2 seconds or so by the pool controller to report the current system status.

BYTE VALUE

==== =============================================

[0] 24-hr time in hours (0-23, decimal)

[1] Time in minutes (0-59, decimal)

[2] Circuits that are on:

When SPA is on, 0x01 (2^0) bit is set

When AUX1 (light) is on, 0x02 (2^1) bit is set

When AUX2 (sweep) is on, 0x04 (2^2) bit is set

When AUX3 is on, 0x08 (2^3) bit is set

When POOL is on, 0x20 (2^5) bit is set

When FEATURE1 is on, 0x10 (2^4) bit is set

When FEATURE2 is on, 0x40 (2^6) bit is set

When FEATURE3 is on, 0x80 (2^7) bit is set

If SPA and POOL bits are both set, spa runs (not pool).

[3] Additional circuits that are on:

When FEATURE4 is on, 0x01 (2^0) bit is set

[4:9] All zero

[10] 0x0f if heater is on; 0x03 if heater is off

[11] Zero

[12] 0x4 (2^2) bit indicates DELAY on AUX2 (and perhaps other circuits).

Bits 0x30 appears to be on all the time. Don’t know why.

[13] 0x08 (on 1.0 fw); 0x00 or 0x01 on 2.070 FW; HAVEN’T FIGURED OUT!!!

[14] Water Temperature (degrees F, only meaningful when circulating)

[15] " " " " " " "

[16] 0x01 on 1.0 FW; 0x02 of 2.070 FW. Major version number? \*

[17] Zero on 1.0 FW 0x46 (= 70 decimal) on 2.070 FW

[18] Air Temperature (degrees Fahrenheit)

[19] Solar Temperature (degrees Fahrenheit)

[20] Zero

[21] 0x32 (50 decimal) in 2.070 FW \*

[22] Heat setting:

Low order 2 bits are pool: 0 off, 1 heater, 2 solar pref, 3 solar

Next 2 bits are spa: 0 off, 4 htr, 8 solar pref, 12 solar

[23] zero in 1.0 FW; 0x10 in 2.070 FW

[24:26] All zero

[27] 0x19 \*

[28] 0x0A; 0x0B on 2.070 FW \*

\* I’ve only seen one value in this field, and I don’t know what it represents.

**Command Code 0x86 - Circuit Status Change Request**

This message is sent by the QuickTouch remote control transceiver to effect a circuit state change.

The first byte of the data is the circuit number. This is not byte [2] of status message! Rather, it is one of these codes: 0x01 represents the SPA, 0x02 is AUX1, 0x03 is AUX2, 0x04 is AUX3, and 0x05 is FEATURE1, 0x06 is POOL, 0x07 is FEATURE2, 0x08 is FEATURE3, 0x09 is FEATURE4, 0x85 is HEAT\_BOOST. The second byte of the data represents the desired state of the circuit, 0x01 for on, 0x00 for off. So, for example, this command would turn the spa on:

<------HEADER-----> SRC DST CMD DLEN <--DATA-> CHECKSUM

0x00 0xFF 0xA5 0x01 0x10 0x48 0x86 0x02 0x01 0x01 0x01 0x88

**Command Code Ox01 - Circuit Status Change Response**

This message is sent in response to a circuit status change rquest, whether it had any effect or not. It has one byte of data, which is always 0x86.

**Command Code OxE1 - Remote Layout Request**

This message is sent periodically by the QuickTouch transceiver to request the button assignments for the remote. It has one byte of data, which is always 0x01.

**Command Code Ox21 - Remote Layout Response**

This message is sent by the controller to indicate which circuits are assigned to which row on the QuickTouch remote. The data consists of four bytes, which are the circuit codes corresponding to rows 1-4 on the remote. The circuit codes are POOL 0x06, SPA 0x01, AUX1 0x02, AUX2 0x03, AUX3 0x04, HEAT\_BOOST 0x85.

**Command Code Ox05 - (I have no idea)**

This message was not present in firmware version 1.0, but is in 2.0.70. It is sent periodically, approximately once every two minutes. Data length is eight bytes. First two are timestamp (same format as system status message). Byte 4 is the number of days the unit has been on (goes up by one at midnight each day). Byte 3 is has a single bit set; it rotates to the left at midnight each day, i.e., it’s a simple function of Byte 4. Last four bytes change infrequently. Last time I worked on this program, they were [9, 4, 0, 0]; now they’re [8, 6, 0, 0].