SmartWall Protocol
Version 1.1.4
Last Revised: 05-02-11 at 2330 EST by Andy Sayler
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This document describes the initial revision of the SmartWall protocol. The protocol is design to run in a Ethernet→IP→UDP environment. All SmartWall Messages are 64-bit aligned and 32 bit sub-aligned.

SmartWall Header Structure (256 bits, 32 bytes):
8 Bits - SmartWall Version
8 Bits - SmartWall Message Scope
8 Bits - SmartWall Message Type
8 Bits - SmartWall Group ID
16 Bits - SmartWall Device Source Address
16 Bits - SmartWall Device Destination Address
64 Bits - Source Device Mask
64 Bits - Target Device Type
16 Bits - Opcode
16 Bits - Total Length
32 Bits - Unused Alignment (Checksum?)

N Bits - Body Data

Version: SmartWall Protocol Version Number. This document describes version 0x01.
Message Scope: SmartWall Protocol Message Scope. The scope determines the format of the body structure (See below). Supported scopes include:

Message Scope	Name	Description
0x00	Reserved	-
0x01	Network Scope	Change/Report Network State or Status
0x02	Device Scope	Change/Report Per Device State or Status
0x03	Channel Scope	Change/Report Per Channel State or Status
~~0xFF~~	~~Error Scope *(Tentative)*~~	~~Error Message~~

Message Type: SmartWall Protocol Message Type. Supported types include:

Message Type	Name	Description

0x00	Reserved	-
0x01	Set	Set property state
0x02	Request	Request property input
0x03	Query	Query property state
0x04	Report	Report property state
0xFF	Error	Error message

Required Replies:
Set -> (Report | Error)
Request -> (Set | Error)
Query -> (Report | Error)
Report -> (SILENT)
Error -> (SILENT)

Source Device Mask: Logical OR of all SmartWall Device types that the source device supports. The source device is required to implement all specified opcodes for (see body data) for its device type(s).

Target Device Type: Device type that given message is targeted at or reportign fromo. Must be singular (not OR masked) type.

Supported types include:

Device Type	Name	Description
0x0000000000000001	Master Controller	SmartWall System Controller
0x0000000000000004	Outlet	Switchable, Monitored SmartOutlet
0x8000000000000000	Universal Type	Universal General Purpose Type

Group ID: SmartWall 8-bit unique installation group ID
Address: SmartWall 16-bit Device Address. Reserved addresses include:

Address	Name	Description
0x0000	Network	SmartWall Internal Network Address
0xFFFF	Broadcast	All SmartWall Devices Respond

Opcode: 16-bit SmartWall device opcode. Opcodes are device type-specific. Valid opcodes for certain devices are given below.

Total Length: Total length of SmartWall message including header and all data in bytes.

SmartWall Device Scope Body Structure:
16 Bits - Number of data bytes operand/result (N)
N Bits - Operand/Result
J Bits - Padding To Bring Body to 64-bit Multiple

Operand/Result: Any value data associated with a given Opcode and channel.

SmartWall Channel Scope Body Structure:
8 Bits - Number of Channels Affected
8 Bits - Padding
16 Bits - Number of data bytes per channel operand/result (N)
32 Bits - Padding
---Repeat “Number of Channels” Times and Pad Each to 64-bit Multiple---
8 Bits - Affected Channel Num
8 Bits - Padding
16 Bits - Padding
32 Bits - Padding
N Bits - Operand/Result
K Bits - Padding To Bring Repeated Section to 64-bit Multiple
---End Repeat---

Number of Channels Affected: The number of channels to which the given Opcode will be applied. Specifies the size of the following Operand/Response Array

Affected Channel: The specific channel to which an entry in the Operand/Response array applies. Channel 255 is reserved for “All Channels”.

Operand/Result: Any value data associated with a given Opcode and channel.

Opcodes

- Universal Type
    - Network
    - Device
        - 0x0000 - INIT (Set, Report)
        - 0x000x - DEVRST
        - 0x8000 - Mismatched Target Type (Error)
        - 0x8001 - Invalid Device Opcode (Error)
        - 0x8002 - Invalid Device MsgType (Error)

    - Channel
        - 0x000x - CHNRST
        - 0x8000 - Invalid Channel Number (Error)
        - 0x8001 - Invalid Channel Opcode (Error)
        - 0x8002 - Invalid Channel MsgType (Error)
- Outlet Type
    - Network
    - Device
    - Channel
        - 0x0010 - STATE (Set, Query) - 1 Byte (Buffered to 8 Bytes)
        - 0x0020 - VOLTAGE (Query)
        - 0x0021 - CURRENT (Query)
        - 0x0022 - POWER (Query)
        - 0x0023 - FREQ (Query)
        - 0x0024 - PHASE (Query)