

Product Specifications

LSC232 Protocol Specification



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1 Introduction

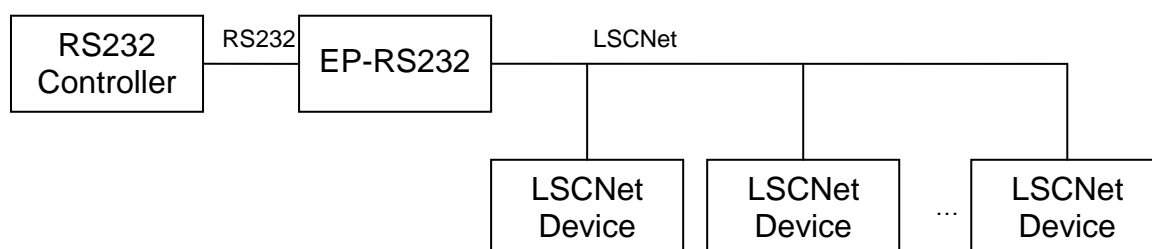
This document describes the protocol used by the EP-RS232 device which converts LSCNet messages into LSC232 serial protocol commands and vice versa. LSCNet protocol is defined in [1]. Note that the following LSCNet commands shall not be supported:

- IP Address Payload
- Hardware Configuration Payload
- Diagnostic command

The EP-RS232 runs on the same hardware as WallPlates with addition of a piggyback board which provides serial RS232 interface.

In order to minimize possible message loss in situations where there is a lot of traffic on LSCNet, EP-RS232 device shall have a FIFO buffer capable of receiving at least **TBA (e.g. 5)** LscNet messages.

Any command received over the LSC232 link shall be acknowledged once processed but before being sent on the LSCNet link.



2 References

1. LscNet Protocol Specification
2. LscNet System Functional Specification

3 Communications Parameters

LSC232 protocol parameters shall be:

- Baud rate: 57600
- Character framing: 8O1
- Valid characters: A-Z 0-9 <LF> <SOX>

All numbers shall be encoded as two/four digit hexadecimal numbers.

The EP-RS232 device may send unsolicited messages to the controller at any time. However, the controller is allowed to send only one command to the EP-RS232 device at any time before it receives an acknowledgement. If the controller doesn't receive an acknowledgement within 3 seconds, it may assume that the command has been lost.

4 Message Format

4.1 Message field types:

```

Letter      := A | B | ... | Z
Hex_Digit  := 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | A | B | C | D | E | F;
Byte       := <Hex_Digit><Hex_Digit>;
Word       := <Byte><Byte>;
Terminator := 0x0A;           - linefeed character <LF>
StartMark  := 0x02;           - start-of-text character <SOX>

```

4.2 Message definitions:

```

Message := <StartMark><Message_ID>[<Address>]{<Parameter>}<Checksum><Terminator>;
Message_ID := "C" | "S" | "I" | "R" | "H" | "D" | "P" | "A" | "E"

```

Where:

```

P: Ping
A: Acknowledgement
E: Error
C: Control Command
S: Status Command
I: Info Command
R: Reset Command
H: Show Control Command

```

```

Address := <Byte><Byte><Byte><Byte>;
Parameter := <Letter>[<Hex_Digit> | <Byte> | <Word>];
Checksum := "X"<Byte>;

```

4.3 Notes:

- All messages shall be started by a Start-of-text (0x02 or '\2' or <SOX>) character.
- All messages shall be terminated by a LineFeed (0x0A or '\n' or <LF>) character.
- No message (excluding start-of-text character) shall be longer than 128 bytes.
- StartMark character shall be ignored from checksum calculation and its purpose is only for synchronisation.
- Address represents the IP address of a LSCNet device. FF.FF.FF.FF represents broadcast address.
- Parameter format will depend on the message type and will be described later
- Checksum will be simple modulo 256 addition of all bytes in the message excluding StartMark, checksum value and Terminator.

4.4 Example:

```
<SOX>C0A00000AM1N1Z00I14R0LFFFTDEADXxx<LF>
```

where

- Control Payload (C)
- Address: 10.0.0.10 (0A00000A)
- Parameter: Mode 1 – Set (M1)
- Parameter: Control – Memory (N1)
- Parameter: Zone 0 (Z00)
- Parameter: Index 20 (I14)
- Parameter: Release 0 (R00)
- Parameter: Level 255 (LFF)
- Parameter: Time 57005 (TDEAD)
- Checksum (Xxx)

For detailed explanation of this and other examples see section 5.

5 Messages

5.1 Ping

This message may be used by the LSC232 controlling device to discover which LSCNet nodes are active. It may be either directed (Address containing an actual device address) or broadcast (Address set to FFFF). Upon receiving this command, active devices shall respond, and their response shall be passed back on to the LSC232 controlling device.

LSCNet devices may issue Ping requests themselves (e.g. Houston). Any Ping requests detected on the LSCNet shall **not** be passed to the LSC232 controlling device.

Parameters:

Mode:

0 – response – cannot be issued by the LS232 Controller

1 – request

Format: M<Hex_Digit>

Examples:

PFFFFFFFMM1Xxx

- ping broadcast request

POA000405M0Xxx

- ping response from device 10.0.4.5

5.2 Acknowledgement

This message can only be sent by the EP-RS232 device to acknowledge that a command from the controller has been successfully received and sent to the LSCNet.

This message cannot be issued by the LSC232 Controller

Parameters:

Message_ID echo

Format: <Message_ID>

Example:

APXxx - Ping request acknowledgement

5.3 Error

This message can only be sent by the EP-RS232 device to indicate an error in processing a request from the controller.

This message cannot be issued by the LSC232 Controller

Parameters:

Error code reflecting the last command Message_ID

- 01: Invalid command

- 02: TBD

- 03: TBD

Format: <Message_ID><Byte>

Example:

EP01Xxx - Invalid ping request

5.4 Control Command

This message represents LSCNet Control Payload. For more details see [1]. This command is essential for the operation of LSCNet systems. See [2] for the functional description of LSCNet systems.

Parameters:

Mode:

- 1: Set
- 2: Update
- 3: Get Data
- 4: Get Data Reply
- 5: Info Data

Format: M<Hex_Digit>

Control Type:

- 1: Memory
- 2: DMX Enable
- 3: Group Master
- 4: Time master
- 5: Lock Enable

Format: N<Hex_Digit>

Zone:

Format: Z<Byte>

Index:

Format: I<Byte>

Released:

- 0: Not released
- 1: Released

Format: R<Hex_Digit>

Level:

Format: L<Byte>

Time:

Format: T<Word>

Example:

C0A000102M1N1Z00IDDR0L00TDEADxxx - Control Command to 10.0.1.2: Set, Memory, Zone 0, Index 221, Not released, Level 0, Time 57005

5.5 Status Command

This message represents LSCNet Status Payload. For more details see [1]. This command is essential for the operation of LSCNet systems. See [2] for the functional description of LSCNet systems.

Note that only a subset of parameters is passed from LSCNet to the RS-232 side.

Mandatory Parameters:

Mode:

- 0: Response - cannot be issued by the LSC232 Controller
- 1: Request
- 2: Alarm request

Format: M<Hex_Digit>

Parameters present in command response only:

DeviceType:

D – Dimmer

W – WallPlate

A – Application

Format: D["A" | "W" | "A"]

Alarm:

TBD

Examples:

S0A000506M1Xxx - Status request for device 10.0.5.6

S0A000506M0DDAnnnnXxx - Status reply from dimmer 10.0.5.6

5.6 Info Command

TBD

5.7 Reset Command

This message represents LSCNet Reset Payload. For more details see [1]. Also see [2] for the functional description of LSCNet systems.

Parameters:

Type:

- 1: System
- 2: Total

Format: T<Hex_Digit>

Example:

R0A000506T1Xxx - System Reset command for device 10.0.5.6

5.8 Show Control Command

TBD