Binary Message Protocol
Full Printable ASCII Compaction Demo

Presented by

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Binary Protocol – Differences Between ASCII & Pseudo Binary

- No Parity Bit in Byte
  - Allows all combinations of 8-bit (aka byte) values.
- Message Length
  - Uses message length in place of ASCII EOT byte.
  - Uses a 14-bit message length field (~16,000 bytes).
  - BCH Forward Error Correction code protects message length and original Flag byte.
- CRC-16
  - Includes a 16-bit CRC appended to data field to replace Odd Parity bits in each byte as was used in the Pseudo Binary and ASCII formats.
  - A 16-bit CRC is sent at the end of the message, and after every 4000 bytes.
  - Code polynomial 0xd175 = $x^{16}+ x^{15}+ x^{13}+ x^{9}+ x^{7}+ x^{6}+ x^{5}+ x^{3}+x+1$
- Reduced Flush
  - 16-bit flush versus 32 bits of flush.

Binary Protocol – Message Format Options

- Open/Standard Message Format
  - Fully user definable data payload; no specifications or restrictions on content and formatting.
- Compact Pseudo Binary Message
  - Provides an easy transition from user's existing Pseudo Binary message for to Binary.
  - Compaction ratio on the order of 20-25%
- Compact ASCII Messages
  - Three separated compaction schemes that provide varying level of compaction ratios (CR) based on message content.
  - Compact Numeric ASCII: Limits character set to numbers, numeric symbols, Space (SP) and CR/LF (carriage return and a linefeed): 0 1 2 3 4 5 6 7 8 9 SP + - . , / # = : E CR/LF
  - Compact SHEF ASCII: Includes all the characters from the Compact Numeric ASCII, and adds semicolon (;) all uppercase letters (A through Z).
  - Compact Full ASCII: Includes all ***printable*** ASCII characters: Space (0x20) through Tilda (~ or 0x7E), HT, CR, LF, and CR/LF.
  - Numeric ASCII: CR ~ 45% – SHEF ASCII: CR ~ 33% – Full ASCII: CR ~ 14%

Compact Full ASCII Demonstration

Binary Protocol – Status and Next Steps

- Status
  - All development complete; Demods, DAMS-NT, DADDS, and Pilot/Test Transmitter.
  - Preparing to deploy to WCDAS DADDS Development Rail and DAMS-NT for testing and fine-tuning.
  - Hoping for initial operational DADDS/DAMS-NT deployment by early summer.
  - Planning for initial operational testing by mid-summer with key DCS users.
  - Binary Protocol Specification document completed and submitted to NOAA.
- Next Steps
  - Final user and manufacturer feedback on Binary Protocol Specification.
  - NOAA to amend Certification Standard for Binary Protocol and determine re-certification procedure.
  - Manufacturers to implement Binary Protocol in DCS transmitters and get certified.
  - User to update DCS transmitters and begin using Binary Protocol.