VEEDER - ROOT
SERIAL INTERFACE MANUAL

for

TLS2
UST Monitoring Systems

through Software Version 7

Manual Number 577013-767
Revision H

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1.0 INTRODUCTION

The serial RS-232 interface is used to connect the system to a controlling computer, a display terminal (CRT), or a printing terminal. A modem can be connected directly to the system to provide telephone line access.

NOTE: The software versions for these systems vary depending on when they were purchased and if software upgrades have been installed. The version in which each function code first appeared is indicated in a box next to its description in Section 7.

2.0 HARDWARE CONNECTIONS

The RS-232 interface for Port 1 is accessed via a 9-pin D-connector located on the bottom of the console. The RS-232 interface for Port 2 is accessed via the 5-pin J-9 connector inside the console.

2.1 RS-232

Port 1 is a panel mount, 9-pin female type D-connector, wired in the DCE configuration. A modem (DCE) may be connected to the interface using a null cable which reverses the wires for the transmit/receive signals. A computer or serial printer (DTE) may be connected with a straight-through cable. Port 1 does not require or activate any hardware handshaking signals unless this option has been selected in the setup menu. RS-232 signals for Port 1 are wired to the 9-pin female D-connector as follows:

Port 1	PIN	
	1	(DCD) Data Carrier Detect
	2	(RXD) Data Received by the console
	3	(TXD) Data Transmitted from the console
	4	(DTR) Data Terminal Ready
	5	(GND) Signal Ground
	6	(DSR) Data Set Ready
	7	(RTS) Request To Send
	8	(CTS) Clear To Send
	9	(N/C) Not connected

RS-232 signals for Port 2, which does not include any hardware handshaking signals, are wired to the 5-pin internal J-9 connector as follows:

Port 2	PIN	
	1	(TXD) Data Transmitted from the console
	2	(RXD) Data Received by the console
	5	(GND) Signal Ground (common return) and Chassis

2.2 EIA RS-232 INTERFACE

The EIA RS-232 interface is designed to connect to modems for transmission of data over telephone lines. It can be used for direct local attachment of terminals if the cable run is no more than 50 feet. In practice, cable runs longer than 50 feet have performed satisfactorily; however, since the RS-232 specification is designed for operation up to 50 feet, direct connect cable runs greater than 50 feet are not warranted for proper operation.

3.0 CHARACTER FORMAT AND BAUD RATE

The system receives and sends characters via the RS-232 interface in an ASCII format that is configured via the system front panel keypads. Selections consist of: 1 start bit; 7 or 8 data bits; odd, even or no parity; and 1 or 2 stop bits. Communications rate is selectable: 300, 1200, 2400, 4800, or 9600 baud. The system operates in a full duplex mode. Characters are not echoed when received, and transmitted characters must not be echoed back to the system. Transmit and receive can occur simultaneously, and commands can be stacked in the system buffer (up to 128 characters).

4.0 SECURITY CODE SETTINGS

A security code can be enabled for each port from the front panel setup menus, or by using the appropriate serial commands. Each port has its own security code which is enabled and set independently. When a security code is enabled for a given port, it must be used in any commands transmitted to that port, in accordance with the format shown below, or else the console will not respond to the command.

5.0 COMMAND MESSAGE FORMAT

All command and response messages are configured in a format which includes a surrounding envelope of control characters and a function code and data field message. The control characters are described in this section, while the function codes and data field messages are described in subsequent sections.

The system responds to a command message that has the following configuration:

SOH	Security Code	Function Code	Data Field

SOH is a fixed Control-A character (ASCII 01), and it indicates the beginning of the message.

The RS-232 security code is an optional six-digit code used to limit external serial access to the system for security purposes. It can be set to any unique set of six characters, using either the front panel setup menus or the external communication interface setup commands. The system will not respond to a command without the proper security code.

The function code is a six character command code which the system interprets to determine the type of action to take and response to return. System function codes and response messages are defined in subsequent sections.

The data field is optional and contains information necessary to perform the selected function (such as setup information).

If the system receives a command message string containing a function code that it does not recognize, it will respond with a <SOH>9999FF1B<ETX>. The "9999" indicates that the system has not understood the command, while the "FF1B" is the appropriate checksum for the preceding <SOH>9999 string.

There is one command which does not follow the above format. The escape command is performed by sending an ESC (escape character, ASCII 27), to the system. It can be used to halt a response message at any time before its completion.

6.0 RESPONSE MESSAGE FORMAT

There are two types of response message formats: computer (or packed data format) and display format. Each format uses a different surrounding envelope of control characters.

6.1 COMPUTER FORMAT

The computer format is a stream of data without any formatting characters; i.e., carriage return, line feed, spaces, labels, etc. The message format is as follows:

SOH	Function Code	Data Field	&&	Checksum	ETX

SOH is a fixed Control-A character (ASCII 01), and it indicates the beginning of the message.

The function code is identical to the received command message function code.

The data field contains the response message which is described in subsequent sections.

The "&&" is a fixed tag character which indicates that the checksum immediately follows.

The Checksum is a series of four ASCII-hexadecimal characters which provide a check on the integrity of all the characters preceding it, including the control characters. The four characters represent a 16-bit binary count which is the 2's complemented sum of the 8-bit binary representation of the message characters after the parity bit (if enabled) has been cleared. Overflows are ignored. The data integrity check can be done by converting the four checksum characters to the 16-bit binary number and adding the 8-bit binary representation of the message characters to it. The binary result should be zero.

ETX is a fixed Control-C character (ASCII 03), and it indicates the end of the message.

6.2 DISPLAY FORMAT

The display format is intended for display on a CRT or printer. It includes all the necessary formatting characters such as carriage returns, line feeds, nulls, spaces, labels, etc. The message format is as follows:

SOH	Function Code	Data Field	ETX

See subsequent sections for a description of the data field response messages.

6.3 ASCII FLOATING POINT FORMAT

6.3.1 NOTES

6.3.1.1 HHHHHHHH (H = 0-9 or A-F) indicates the 8 "nibble" ASCII-Hexadecimal representation of a 4-Byte Floating Point number. Many data parameters are transmitted in this format.

6.3.1.2 The 32-bits are arranged as follows:

Byte	1		2		3		4	
	S EEE	EEEE	E MMM	MMMM	MMMM	MMMM	MMMM	MMMM
Nibble	1	2	3	4	5	6	7	8

S is the sign bit (0 if positive, 1 if negative).

EEE EEEE E represents the 2's exponent. It is a 2's complement value biased by 127 (7F Hex). The exponent can be determined by subtracting 127 from the value of the E field and raising 2 to the resulting power.

MMM MMMM MMMM MMMM MMMM MMMM represents the 23-bit mantissa. Since the mantissa describes a value which is greater than or equal to 1.0 and less than 2.0, the 24th bit is always assumed to be equal to 1 and is not transmitted or stored. The value of the mantissa can be determined by dividing the value of the M field by 8,388,608 (2^{23}) and adding 1.0.

6.3.1.3 The complete value of the floating point number can then be determined by multiplying the exponent by the mantissa and attaching the appropriate positive or negative sign.

6.3.1.4 By convention, 00 00 00 00 represents the value 0.0 even though it actually converts to 5.8775×10^{-39}.

6.3.1.5 The eight "nibbles" are transmitted in sequence from 1 through 8 as shown in section 6.3.1.2.

6.3.2 EXAMPLES

6.3.2.1 3F800000 hex = 0011 1111 1000 0000 0000 0000 0000 0000 bin

S = 0 = + (positive)
E = 011 1111 1 bin = 7F hex = 127 dec
M = 000 0000 0000 0000 0000 0000 bin = 0 hex = 0 dec

Exponent = $2^{(127-127)}$ = 1.0
Mantissa = 1.0 + (0/8,388,608) = 1.0
Decimal Value = +1.0 x 1.0 = 1.0

6.3.2.2 B8D1B717 hex = 1011 1000 1101 0001 1011 0111 0001 0111 bin

S = 1 = - (negative)
E = 011 1000 1 bin = 71 hex = 113 dec
M = 101 0001 1011 0111 0001 0111 bin = 51 B7 17 hex = 5,355,287 dec

Exponent = $2^{(113-127)}$ = 0.0000610352
Mantissa = 1.0 + (5,355,287/8,388,608) = 1.63840
Decimal Value = -0.0000610352 x 1.63840 = -0.0001

6.3.2.3 C2C7FAE1 hex = 1100 0010 1100 0111 1111 1010 1110 0001 bin

S = 1 = - (negative)
E = 100 0010 1 bin = 85 hex = 133 dec
M = 100 0111 1111 1010 1110 0001 bin = 47 FA E1 hex = 4,717,281 dec

Exponent = $2^{(133-127)}$ = 64
Mantissa = 1.0 + (4,717,281/8,388,608) = 1.56234
Decimal Value = -64 x 1.56234 = -99.99

6.3.2.4 461C4000 hex = 0100 0110 0001 1100 0100 0000 0000 0000 bin

S = 0 = + (positive)
E = 100 0110 0 bin = 8C hex = 140 dec
M = 001 1100 0100 0000 0000 0000 bin = 1C 40 00 hex = 1,851,392 dec

Exponent = $2^{(140-127)}$ = 8,192
Mantissa = 1.0 + (1,851,392/8,388,608) = 1.22070
Decimal Value = +8,192 x 1.22070 = 10,000

7.0 FUNCTION CODES AND RESPONSE MESSAGES

The function codes and data fields of the message formats are described in this section.

Most response messages can be requested for either a single device (tank, etc.) or all devices. A "TT" in the function code signifies single device number 01 through 16. When "TT" is 00, it signifies all devices.

Typically, response messages include information on the active devices only. That is, those devices that are connected and working. However, the system can be forced to send data on inactive devices by using an inactive device number. In this case, if no valid data is available on a device, the message is filled out with question marks (?) in the place of numbers.

Computer format response messages do not include any formatting characters such as carriage returns, line feeds, spaces, nulls, labels, etc. Only those characters shown are actually included in the response message. For convenience, the messages are shown in segments and do not actually include any line feeds, carriage returns, etc. Also, the notes to the right and between the message lines are not included in the messages. All number values contained in the response messages retain leading zeroes.

Display format response messages include the formatting characters shown. All message lines end with a carriage return, line feed, and six nulls. All response messages start and end with at least one blank line.

The system function codes and response messages are described in detail in the following sections. A summary list of all function codes is given at the end of this document.

7.1 CONTROL FUNCTIONS

Function Code: **001** Version 1
Function Type: System Reset

Command Format:
Display: <SOH>S00100
Computer: <SOH>s00100

Typical Response Message, Display Format:

```
<SOH>
S00100
 22-05-01 14:51
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s00100YYMMDDHHmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. && - Data Termination Flag
3. CCCC - Message Checksum

Function Code: **003** Version 1
Function Type: Remote Alarm Reset

Command Format:
Display: <SOH>S00300
Computer: <SOH>s00300

Typical Response Message, Display Format:

```
<SOH>
S00300
 22-05-01 14:54
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s00300YYMMDDHHmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. && - Data Termination Flag
3. CCCC - Message Checksum

Function Code: **010** Version 1
Function Type: Computer Mode Autodial Hang-up

Command Format:
Display: <SOH>S01000
Computer: <SOH>s01000

Typical Response Message, Display Format:

```
<SOH>
S01000
 22-05-01 14:54
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s01000YYMMDDHHmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. This command ends the current autodial session for this port and clears any active autodial alarms on the port
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **052** Version 1
Function Type: Start In-Tank Leak Detect Test

Command Format:
Display: <SOH>S052TT
Computer: <SOH>s052TT

Typical Response Message, Display Format:

```
<SOH>
S05201
 22-05-01 14:55
TANK   PRODUCT LABEL
  1  REGULAR UNLEADED       LEAK TEST START
                            TEST BY EXTERN INTERFACE
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s052TTYYMMDDHHmmTTk&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. k - Status Flag - 0 = OFF, 1 = ON
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **053** Version 1
Function Type: Stop In-Tank Leak Detect Test

Command Format:
Display: <SOH>S053TT
Computer: <SOH>s053TT

Typical Response Message, Display Format:

```
<SOH>
S05301
 22-05-01 14:55
TANK   PRODUCT LABEL
  1  REGULAR UNLEADED       LEAK TEST STOP
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s053TTYYMMDDHHmmTTk&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. k - Status Flag - 0 = OFF, 1 = ON
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **09E** Version 5
Function Type: Setup Password Log In

Command Format:
Display: <SOH>S09E00PPPPPPPPPPPPPPP
Computer: <SOH>s09E00PPPPPPPPPPPPPPP

Notes:
1. P - Setup Password (6 to 16 ASCII characters [20h-7Eh])

Typical Response Message, Display Format:

```
<SOH>
I09E00
    07-12-09 09:43

SETUP PASSWORD LOG IN

COMM 1: LOGGED IN
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s09E00YYMMDDHHmmpS&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. p - Port Number
3. S - Log In Status
   0 = Logged Out
   1 = Logged In
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **09F** Version 5
Function Type: Setup Password Log Out

Command Format:
Display: <SOH>S09F00149
Computer: <SOH>s09F00149

Notes:
1. 149 - code must be sent to confirm the command

Typical Response Message, Display Format:

```
<SOH>
I09F00
    07-12-09 09:43

SETUP PASSWORD LOG OUT

COMM 1: LOGGED OUT
<ETX>
```

Typical Response Message, Computer Format:

<SOH>s09F00YYMMDDHHmmpS&&CCCC<ETX>

Notes:
1. YYMMDDHHmm - Current Date and Time
2. p - Port Number
3. S - Log In Status
   0 = Logged Out
   1 = Logged In
4. && - Data Termination Flag

7.2 OPERATIONAL REPORTS

7.2.1 SYSTEM REPORTS

Function Code: **101** Version 1
Function Type: System Status Report

Command Format:
Display: <SOH>I10100
Computer: <SOH>i10100

Notes:
1. This command will report all active OR unacknowledged alarms and warnings up to the limit of 25 alarms in display format, and 150 alarms in computer format

Typical Response Message, Display Format:

```
<SOH>
I10100
 22-05-01 14:55

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

SYSTEM STATUS REPORT

  ALL FUNCTIONS NORMAL
<ETX>
```

Function Code 101 Notes: (Continued)

Typical Response Message, Computer Format:

```
   <SOH>i10100YYMMDDHHmmAANNTT...
                        AANNTT&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. AA - Alarm/Warning Category:
   - 00 - All Functions Normal
   - 02 - Tank Alarm
   - 14 - Auto-Dial Fax Alarm
3. NN - Alarm Type Number:
   - If AA is 02 and NN is:
     - 03 = Tank High Water Alarm
     - 04 = Tank Overfill Alarm
     - 05 = Tank Low Product Alarm
     - 08 = Tank Invalid Fuel Level Alarm
     - 09 = Tank Probe Out Alarm
     - 11 = Tank Delivery Needed Warning
     - 12 = Tank Maximum Product Alarm
     - 13 = Tank Gross Leak Test Fail Alarm
     - 14 = Tank Periodic Leak Test Fail Alarm
     - 15 = Tank Annual Leak Test Fail Alarm
     - 27 = Tank Cold Temperature Warning
   - If AA is 14 and NN is:
     - 02 = Autodial Failed Alarm
4. TT - Tank/Sensor Number
5. && - Data Termination Flag
6. CCCC - Message Checksum

Function Code: 103 Version 4
Function Type: System Identification Report

Command Format:
Display: <SOH>I10300
Computer: <SOH>i10300

Typical Response Message, Display Format:

```
<SOH>
I10300
 22-05-08 14:58

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i10300YYMMDDHHmma...a&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. a - Header Lines (80 ASCII characters from 20 Hex - 7E Hex)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: 111 Version 1
Function Type: Priority Alarm History Report

Command Format:
Display: <SOH>I11100
Computer: <SOH>i11100

Typical Response Message, Display Format:

```
<SOH>
I11100
 22-05-01 14:55

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

PRIORITY ALARM HISTORY REPORT

ID  DESCRIPTION          ALARM TYPE           STATUS DATE     TIME
T 1 REGULAR UNLEADED     PROBE OUT            CLEAR  19-03-01 23:43
T 2 PRODUCT #2           PROBE OUT            CLEAR  19-03-01 23:43
T 3 PRODUCT #3           PROBE OUT            CLEAR  19-03-01 23:43
T 4 PRODUCT #4           PROBE OUT            CLEAR  19-03-01 23:43
T 5 PRODUCT #5           PROBE OUT            CLEAR  19-03-01 23:43
T 6 PRODUCT #6           PROBE OUT            CLEAR  19-03-01 23:43
T 1 REGULAR UNLEADED     PROBE OUT            ALARM  19-03-01 23:36
T 2 PRODUCT #2           PROBE OUT            ALARM  19-03-01 23:36
T 3 PRODUCT #3           PROBE OUT            ALARM  19-03-01 23:36
T 4 PRODUCT #4           PROBE OUT            ALARM  19-03-01 23:36
T 5 PRODUCT #5           PROBE OUT            ALARM  19-03-01 23:36
T 6 PRODUCT #6           PROBE OUT            ALARM  19-03-01 23:36
<ETX>
```

Function Code 111 Notes: (Continued)

Typical Response Message, Computer Format:

```
   <SOH>i11100YYMMDDHHmmAAccNNTTSSYYMMDDHHmm...
                        AAccNNTTSSYYMMDDHHmm&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. AA - Alarm/Warning Category:
   - 00 - All Functions Normal
   - 02 - Tank Alarm
   - 14 - Auto-Dial Alarm
3. cc - Sensor Category
   - 00 - Unused
4. NN - Alarm Type Number:
   - If AA is 02 and NN is:
     - 03 = Tank High Water Alarm
     - 04 = Tank Overfill Alarm
     - 05 = Tank Low Product Alarm
     - 08 = Tank Invalid Fuel Level Alarm
     - 09 = Tank Probe Out Alarm
     - 11 = Tank Delivery Needed Warning
     - 12 = Tank Maximum Product Alarm
     - 13 = Tank Gross Leak Test Fail Alarm
     - 14 = Tank Periodic Leak Test Fail Alarm
     - 15 = Tank Annual Leak Test Fail Alarm
     - 27 = Tank Cold Temperature Warning
   - If AA is 14 and NN is:
     - 02 = Autodial Failed Alarm
5. TT - Tank/Sensor Number
6. SS - Alarm State
   - 01 = Alarm cleared
   - 02 = Alarm occurred
7. YYMMDDHHmm - Date/Time Alarm state occurred
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **112** Version 1
Function Type: Non-Priority Alarm History Report

Command Format:
Display: <SOH>I11200
Computer: <SOH>i11200

Typical Response Message, Display Format:

```
<SOH>
I11200
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

NON PRIORITY ALARM HISTORY REPORT

ID  DESCRIPTION          ALARM TYPE           STATUS DATE     TIME
T 1 REGULAR UNLEADED     PROBE OUT            CLEAR  19-03-01 23:36
T 1 REGULAR UNLEADED     PROBE OUT            ALARM  19-03-01 23:36
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i11200YYMMDDHHmmAAccNNTTSSYYMMDDHHmm...
                      AAccNNTTSSYYMMDDHHmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. AA - Alarm/Warning Category:
   See explanation for "AA" in Function i11100
3. cc - Sensor Category
   See explanation for "cc" in Function i11100
4. NN - Alarm Type Number:
   See explanation for "NN" in Function i11100
5. TT - Tank/Sensor Number
6. SS - Alarm State
   01 = Alarm cleared
   02 = Alarm occurred
7. YYMMDDHHmm - Date/Time Alarm state occurred
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **113** Version 1
Function Type: Active Alarm Report

Command Format:
Display: <SOH>I11300
Computer: <SOH>i11300

Notes:
1. This command will report ALL active alarms and warnings regardless of their acknowledgement state. If there are more than can be contained in the non-priority and priority history storage areas, they will be reported here without time and date stamps

Typical Response Message, Display Format:

```
<SOH>
I11300
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

ACTIVE ALARM STATUS

ID  DESCRIPTION           ALARM TYPE            DATE     TIME
T 1 REGULAR UNLEADED      PROBE OUT             19-03-01 23:36
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i11300YYMMDDHHmma..ab..bc..cd..dAAccNNTTYYMMDDHHmm...
                                    AAccNNTTYYMMDDHHmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. a..a - Station Header 1: 20 ASCII characters
3. b..b - Station Header 2: 20 ASCII characters
4. c..c - Station Header 3: 20 ASCII characters
5. d..d - Station Header 4: 20 ASCII characters
6. AA - Alarm/Warning Category:
   See explanation for "AA" in Function i11100
7. cc - Sensor Category
   See explanation for "cc" in Function i11100
8. NN - Alarm Type Number:
   See explanation for "NN" in Function i11100
9. TT - Tank/Sensor Number
10. YYMMDDHHmm - Alarm Date and Time
11. && - Data Termination Flag
12. CCCC - Message Checksum

Function Code: **114** Version 1
Function Type: Cleared Alarm Report

Command Format:
Display: <SOH>I11400
Computer: <SOH>i11400

Typical Response Message, Display Format:

```
<SOH>
I11400
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

CLEARED ALARMS REPORT

ID  DESCRIPTION          ALARM TYPE           STATUS DATE     TIME
T 1 REGULAR UNLEADED     PROBE OUT            CLEAR  19-03-01 23:36
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i11400YYMMDDHHmma..ab..bc..cd..dAAccNNTTSSYYMMDDHHmm...
                                    AAccNNTTSSYYMMDDHHmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. a..a - Station Header 1: 20 ASCII characters
3. b..b - Station Header 2: 20 ASCII characters
4. c..c - Station Header 3: 20 ASCII characters
5. d..d - Station Header 4: 20 ASCII characters
6. AA - Alarm/Warning Category:
   See explanation for "AA" in Function i11100
7. cc - Sensor Category:
   See explanation for "cc" in Function i11100
8. NN - Alarm Type Number:
   See explanation for "NN" in Function i11100
9. TT - Tank/Sensor Number
10. SS - Alarm State
    01 = Alarm cleared
    02 = Alarm occurred
11. YYMMDDHHmm - Clear Alarm Date and Time
12. && - Data Termination Flag
13. CCCC - Message Checksum

Function Code: **117** Version 1
Function Type: Priority Alarm History Report II

Command Format:
Display: <SOH>I11700
Computer: <SOH>i11700

Typical Response Message, Display Format:

```
<SOH>
I11700
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

PRIORITY ALARM HISTORY REPORT

ID  DESCRIPTION          ALARM TYPE           STATUS DATE     TIME      REPEAT
T 1 REGULAR UNLEADED     PROBE OUT            CLEAR  19-03-01 23:36          0
T 1 REGULAR UNLEADED     PROBE OUT            ALARM  19-03-01 23:36          0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iii700YYMMDDHHmmAAccNNTTSSYYMMDDHHmmaaaa...
                     AAccNNTTSSYYMMDDHHmmaaaa&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. AA - Alarm/Warning Category
   See explanation for "AA" in Function i11100
3. cc - Sensor Category
   See explanation for "cc" in Function i11100
4. NN - Alarm Type Number
   See explanation for "NN" in Function i11100
5. TT - Tank/ Sensor Number
6. SS - Alarm State
   01 B Alarm cleared
   02 B Alarm occurred
7. YYMMDDHHmm - Date and Time first alarm occurred
8. aaaa - number of times alarm occurred (hex)
9. && - Data Termination Flag
10. CCCC - Message Checksum

Function Code: 118 Version 1
Function Type: Non-Priority Alarm History Report II

Command Format:
Display: <SOH>I11800
Computer: <SOH>i11800

Typical Response Message, Display Format:

```
<SOH>
I11800
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

NON PRIORITY ALARM HISTORY REPORT

ID  DESCRIPTION          ALARM TYPE           STATUS DATE     TIME      REPEAT
T 1 REGULAR UNLEADED     PROBE OUT            CLEAR  19-03-01 23:36          0
T 1 REGULAR UNLEADED     PROBE OUT            ALARM  19-03-01 23:36          0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i11800YYMMDDHHmmAAccNNTTSSYYMMDDHHmmaaaa...
                      AAccNNTTSSYYMMDDHHmmaaaa&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. AA - Alarm/Warning Category
   See explanation for "AA" in Function i11100
3. cc - Sensor Category
   See explanation for "cc" in Function i11100
4. NN - Alarm Type Number
   See explanation for "NN" in Function i11100
5. TT - Tank/ Sensor Number
6. SS - Alarm State
   01 B Alarm cleared
   02 B Alarm occurred
7. YYMMDDHHmm - Date and Time first alarm occurred
8. aaaa - number of times alarm occurred (hex)
9. && - Data Termination Flag
10. CCCC - Message Checksum

7.2.2 IN-TANK REPORTS

Function Code: 201 Version 1
Function Type: In-Tank Inventory Report

Command Format:
Display: <SOH>I201TT
Computer: <SOH>i201TT

Typical Response Message, Display Format:

```
<SOH>
I20101
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

INVENTORY REPORT

TANK PRODUCT             VOLUME TC VOLUME   ULLAGE   HEIGHT    WATER     TEMP
  1  REGULAR UNLEADED      5329      5413     4699    48.97     0.00    37.39
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i201TTYYMMDDHHmmTTpssssNNFFFFFFFF...
                      TTpssssNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. ssss - Tank Status Bits:
   - Bit 1 - (LSB) Delivery in Progress
   - Bit 2 - Leak Test in Progress
   - Bit 3 - Invalid Fuel Height Alarm (MAG Probes Only)
   - Bit 4-16 - Unused
5. NN - Number of eight character Data Fields to follow (Hex)
6. FFFFFFFF - ASCII Hex IEEE float:
   1. Volume
   2. TC Volume
   3. Ullage
   4. Height
   5. Water
   6. Temperature
   7. Water Volume
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: 202 Version 1
Function Type: In-Tank Delivery Report

Command Format:
Display: <SOH>I202TT
Computer: <SOH>i202TT

Typical Response Message, Display Format:

```
<SOH>
I20201
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

DELIVERY REPORT

TANK    1 REGULAR UNLEADED
INCREASE   DATE     TIME        VOLUME TC VOLUME  WATER   TEMP  HEIGHT
     END: 21-05-01 15:14          3231      3194   0.00  76.14   48.27
   START: 21-05-01 15:05          1244      1231   0.00  73.89   24.40
  AMOUNT:                         1987      1963
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i202TTYYMMDDHHmmTTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFF...
                     TTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. dd - Number of Deliveries to follow (Decimal, 00 if no data available for this tank)
5. YYMMDDHHmm - Starting Date/Time
6. YYMMDDHHmm - Ending Date/Time
7. NN - Number of eight character Data Fields to follow (Hex)
8. FFFFFFFF - ASCII Hex IEEE float:
    1. Starting Volume
    2. Starting TC Volume
    3. Starting Water
    4. Starting Temp
    5. Ending Volume
    6. Ending TC Volume
    7. Ending Water
    8. Ending Temp
    9. Starting Height
    10. Ending Height
9. && - Data Termination Flag
10. CCCC - Message Checksum

Function Code: 203 Version 1
Function Type: In-Tank Leak Detect Report

Command Format:
Display: <SOH>I203TT
Computer: <SOH>i203TT

Typical Response Message, Display Format:

```
<SOH>
I20301
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

IN-TANK LEAK TEST REPORT

T 1 REGULAR UNLEADED
       TEST STATUS: OFF   0.20 GAL/HR TEST PASS
TEST STARTING TIME:     19-05-01 10:30 PM   TEST LENGTH:    3.0 HOURS
  START TEMP:   58.7 DEG F    START VOLUME:  2123.2 GAL
    END TEMP:   58.1 DEG F       LEAK RATE:   -0.01 GAL/HR

CUMULATIVE PERIODIC VOLUME CHANGE (GAL):
  -0.01   -0.02   -0.01   -0.03   -0.05   -0.04
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i203TTYYMMDDHHmmTTpYYMMDDHHmmHHNNFFFFFFFF...
                      TTpYYMMDDHHmmHHNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. YYMMDDHHmm - Starting Date/Time
5. HH - Test Duration (hours)
6. NN - Number of eight character Data Fields to follow (Hex)
7. FFFFFFFF - ASCII Hex IEEE float:
   1. Starting Temp
   2. Ending Temp
   3. Starting Volume
   4. Ending Rate
   5. Hourly changes up to the number of fields
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **204** Version 1
Function Type: In-Tank Shift Inventory Report

Command Format:
Display: <SOH>I204TT
Computer: <SOH>i204TT

Typical Response Message, Display Format:

```
<SOH>
I20401
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

SHIFT REPORT


TANK   PRODUCT

   1   REGULAR UNLEADED        VOLUME TC VOLUME  ULLAGE  HEIGHT  WATER   TEMP
   SHIFT  1 STARTING VALUES      8518      8492    1482   76.26   0.00  64.57
            ENDING VALUES        8518      8492    1482   76.26   0.00  64.57
            DELIVERY VALUE          0
            TOTALS                  0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i204TTYYMMDDHHmmTTpssNNFFFFFFFF...
                     TTpssNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. ss - Shift Number 01, 02, 03
5. NN - Number of eight character Data Fields to follow (Hex)
6. FFFFFFFF - ASCII Hex IEEE float:
   1. Start Volume
   2. Start Ullage
   3. Start TC Volume
   4. Start Height
   5. Start Water
   6. Start Temperature
   7. End Volume
   8. End Ullage
   9. End TC Volume
   A. End Height
   B. End Water
   C. End Temperature
   D. Total Value
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: **205** Version 1
Function Type: In-Tank Status Report

Command Format:
Display: <SOH>I205TT
Computer: <SOH>i205TT

Typical Response Message, Display Format:

```
<SOH>
I20501
 22-05-01 14:57

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

STATUS REPORT

TANK
   1  ALL FUNCTIONS NORMAL
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i205TTYYMMDDHHmmTTnnAA...
                     TTnnAA...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. nn - Number of alarms active for tank (Hex, 00 = none)
4. AA - Active tank alarm type:
   - 03 = Tank High Water Alarm
   - 04 = Tank Overfill Alarm
   - 05 = Tank Low Product Alarm
   - 08 = Tank Invalid Fuel Level Alarm
   - 09 = Tank Probe Out Alarm
   - 11 = Tank Delivery Needed Warning
   - 12 = Tank Maximum Product Alarm
   - 13 = Tank Gross Leak Test Fail Alarm
   - 14 = Tank Periodic Leak Test Fail Alarm
   - 15 = Tank Annual Leak Test Fail Alarm
   - 27 = Tank Cold Temperature Warning
5. && - Data Termination Flag
6. CCCC - Message Checksum

Function Code: 206 Version 1
Function Type: In-Tank Alarm History Report

Command Format:
Display: <SOH>I206TT
Computer: <SOH>i206TT

Typical Response Message, Display Format:

```
<SOH>
I20601
 22-05-01 14:57

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

TANK ALARM HISTORY

TANK 1  REGULAR UNLEADED

     PROBE OUT                19-03-01 23:36
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i206TTYYMMDDHHmmTTnnYYMMDDHHmmaaaa...
                      TTnnYYMMDDHHmmaaaa...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. nn - Number of alarms in history for tank (Decimal, 00 = none)
4. YYMMDDHHmm - Date and time alarm occurred
5. aaaa - Type of alarm:
   - 0003 = Tank High Water Alarm
   - 0004 = Tank Overfill Alarm
   - 0005 = Tank Low Product Alarm
   - 0008 = Tank Invalid Fuel Level Alarm
   - 0009 = Tank Probe Out Alarm
   - 000B = Tank Delivery Needed Warning
   - 000C = Tank Maximum Product Alarm
   - 000D = Tank Gross Leak Test Fail Alarm
   - 000E = Tank Periodic Leak Test Fail Alarm
   - 000F = Tank Annual Leak Test Fail Alarm
   - 001B = Tank Cold Temperature Warning
6. && - Data Termination Flag
7. CCCC - Message Checksum

Function Code: 207 Version 1
Function Type: In-Tank Leak Test History Report

Command Format:
Display: <SOH>I207TT
Computer: <SOH>i207TT

Typical Response Message, Display Format:

```
<SOH>
I20701
 22-05-01 14:57

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

TANK LEAK TEST HISTORY

T 1 REGULAR UNLEADED

LAST GROSS TEST PASSED:
TEST START TIME            HOURS    VOLUME   % VOLUME   TEST TYPE
     29-04-01 06:02                   2821       48.9    STANDARD

LAST ANNUAL TEST PASSED:

NO TEST PASSED

FULLEST ANNUAL TEST PASS

NO TEST PASSED

LAST PERIODIC TEST PASS:
TEST START TIME            HOURS    VOLUME   % VOLUME   TEST TYPE
     29-04-01 06:02         3        2680       46.4    STANDARD


FULLEST PERIODIC TEST
PASSED EACH MONTH:

TEST START TIME            HOURS    VOLUME   % VOLUME   TEST TYPE
     29-04-01 06:02         3        2916       50.5    STANDARD
<ETX>
```

Function Code 207 Notes: (Continued)

Typical Response Message, Computer Format:

```
<SOH>i207TTYYMMDDHHmmTTNNRRnnttYYMMDDHHmmhhhhhhhhVVVVVVVVpppppppp...
                    TTNNRRnnttYYMMDDHHmmhhhhhhhhVVVVVVVVpppppppp...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. NN - Number of Leak History Reports to Follow (Hex)
4. RR - Leak Report Type:
   - 00 = Last Test Passed
   - 01 = Fullest Test Passed
   - 02 = Fullest Periodic Monthly Test Passed
5. nn - Leak History Number (1 - 12) for first Monthly Tests Passed
6. tt - In-Tank Leak Test Type:
   - 00 = 0.2 gal/hr test
   - 01 = 0.1 gal/hr test
   - 02 = Gross (3 gal/hr)test
7. YYMMDDHHmm - In-Tank Leak Test Start Time
8. hhhhhhhh - Leak Test Duration in Hours (ASCII Hex IEEE float)
9. VVVVVVVV - Leak Test Volume (ASCII Hex IEEE float)
10. pppppppp - Leak Test Percentage of Full Volume (ASCII Hex IEEE float)
11. && - Data Termination Flag
12. CCCC - Message Checksum

Function Code: 208 Version 1
Function Type: In-Tank Leak Test Results Report

Command Format:
Display: <SOH>I208TT
Computer: <SOH>i208TT

Typical Response Message, Display Format:

```
<SOH>
I20801
 22-05-01 14:57

PREVIOUS IN TANK LEAK TEST RESULTS

TANK 1    REGULAR UNLEADED
TEST TYPE  START TIME              RESULT     RATE  HOURS  VOLUME
 ANNUAL      19-05-01  02:00       INVALID    0.00   2.0    8120
 PERIODIC    19-05-01  02:00       PASSED     0.00   2.0    8120
 GROSS       19-05-01  02:00       PASSED     0.00          8120
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i208TTYYMMDDHHmmTTNNttmmYYMMDDHHmmRRrrrrrrrrhhhhhhhhVVVVVVVV...
                       TTNNttmmYYMMDDHHmmRRrrrrrrrrhhhhhhhhVVVVVVVV...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. NN - Number of Results to Follow (Hex)
4. tt - In-Tank Leak Test Result Type:
   00 = 0.2 gal/hr Test
   01 = 0.1 gal/hr Test
   02 = Gross (3 gal/hr) Test
5. mm - In-Tank Leak Manifold Status:
   00 = Tank Not Manifolded During Leak Test
   01 = Tank Manifolded During Leak Test
6. YYMMDDHHmm - Previous In-Tank Leak Test Start Time
7. RR - Previous In-Tank Leak Test Result:
   00 = Test Invalid
   01 = Test Passed
   02 = Test Failed
8. rrrrrrrr - Test Rate (ASCII Hex IEEE float)
9. hhhhhhhh - Leak Test Duration in Hours (ASCII Hex IEEE float)
10. VVVVVVVV - Leak Test Volume (ASCII Hex IEEE float)
11. && - Data Termination Flag
12. CCCC - Message Checksum

Function Code: 209 Version 1
Function Type: In-Tank Enhanced Leak Detect Report

Command Format:
Display: <SOH>I209TT
Computer: <SOH>i209TT

Typical Response Message, Display Format:

```
<SOH>
I20901
 22-05-01 14:57

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

ENHANCED IN-TANK LEAK TEST REPORT

T 1 REGULAR UNLEADED
       TEST STATUS: OFF   0.20 GAL/HR TEST PASS
TEST STARTING TIME:     19-05-01 10:30 PM   TEST LENGTH:    3.0 HOURS
  START TEMP:   58.7 DEG F    START VOLUME:   2123.2 GAL
    END TEMP:   58.1 DEG F  PERCENT VOLUME:     70.8
                                 LEAK RATE:    -0.01 GAL/HR
                                 THRESHOLD:    -0.13 GAL/HR
                                    HEIGHT:     68.0 IN
                                     WATER:      0.0 IN

CUMULATIVE PERIODIC VOLUME CHANGE (GAL):
  -0.01   -0.02   -0.01   -0.03   -0.05   -0.04
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i209TTYYMMDDHHmmTTpYYMMDDHHmmHHNNFFFFFFFF...
                     TTpYYMMDDHHmmHHNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. YYMMDDHHmm - Starting Date/Time
5. HH - Test Duration (hours)
6. NN - Number of eight character Data Fields to follow (Hex)
7. FFFFFFFF - ASCII Hex IEEE float:
   1. Starting Temp
   2. Ending Temp
   3. Starting Volume
   4. Ending Rate
   4. Starting Fuel Height
   5. Starting Water Height
   6. Starting Water Height
   7. Hourly changes up to the number of fields
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **20C** Version 1
Function Type: In-Tank Most Recent Delivery Report

Command Format:
Display: <SOH>I20CTT
Computer: <SOH>i20CTT

Typical Response Message, Display Format:

```
<SOH>
I20C01
 22-05-01 14:57

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

LAST DELIVERY REPORT

TANK    1 REGULAR UNLEADED
INCREASE   DATE     TIME        VOLUME TC VOLUME  WATER   TEMP  HEIGHT
     END: 21-05-01 15:14          3231      3194   0.00  76.14   48.27
   START: 21-05-01 15:05          1244      1231   0.00  73.89   24.40
  AMOUNT:                         1987      1963
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i20CTTYYMMDDHHmmTTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFF...
                      TTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. dd - Number of Deliveries to follow (Decimal, 00 if no data available for this tank)
5. YYMMDDHHmm - Starting Date/Time
6. YYMMDDHHmm - Ending Date/Time
7. NN - Number of eight character Data Fields to follow (Hex)
8. FFFFFFFF - ASCII Hex IEEE float:
    1. Starting Volume
    2. Starting TC Volume
    3. Starting Water
    4. Starting Temp
    5. Ending Volume
    6. Ending TC Volume
    7. Ending Water
    8. Ending Temp
    9. Starting Height
    10. Ending Height
9. && - Data Termination Flag
10. CCCC - Message Checksum

Function Code: **20D** Version 1
Function Type: In-Tank Stick Height Report

Command Format:
Display: <SOH>I20DTT
Computer: <SOH>i20DTT

Notes:
1. This command will respond only if stick height is enabled. Tank stick height is fuel height (without tilt) + stick offset. If the stick height is less then zero, it will be set to zero. If the stick height is greater than tank diameter, it will be set to tank diameter.

Typical Response Message, Display Format:

```
<SOH>
I20D01
 22-05-01 14:57

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

TANK STICK HEIGHT

TANK   PRODUCT LABEL             INCHES
 1     REGULAR UNLEADED           79.24
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i20DTTYYMMDDHHmmTTFFFFFFFF...
                     TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Stick Height (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: 214 Version 5
Function Type: In-Tank Mass/Density Inventory Report

Command Format:
Display: <SOH>I214TT
Computer: <SOH>i214TT

Typical Response Message, Display Format:

```
<SOH>
I214TT
 04-30-09  2:18 PM

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

IN-TANK MASS INVENTORY

                                                        TC
TANK PRODUCT              VOLUME    MASS  DENSITY  OFFSET  HEIGHT  WATER   TEMP
  1  PRODUCT 1              7343   44521    45.35  -0.022    16.5    0.0   78.8
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i214TTYYMMDDHHmmTTpssssNNFFFFFFFF...
                      TTpssssNNFFFFFFFF&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. p - Product Code (single ASCII character [20h-7Eh])
4. ssss - Tank Status Bits:
   Bit 1=(LSB) Delivery in Progress
   Bit 2=Leak Test in Progress
   Bit 3=Invalid Fuel Height Alarm (MAG Probes Only)
   Bit 4-16 - Unused
5. NN - Number of eight character Data Fields to follow (Hex)
6. FFFFFFFF - ASCII Hex IEEE float:
   1. Volume
   2. Mass
   3. Density
   4. Height
   5. Water
   6. Temperature
   7. TC Density
   8. TC Volume
   9. Ullage
   10. Water Volume
   11. Total TC Density Offset
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: 215 Version 5
Function Type: In-Tank Mass/Density Delivery Report

Command Format:
Display: <SOH>I215TT
Computer: <SOH>i215TT

Typical Response Message, Display Format:

```
<SOH>
I215TT
    04-30-09  2:46 PM
T 1:PRODUCT 1                                          TC
INCREASE   DATE / TIME    VOLUME    MASS  DENSITY  OFFSET  WATER   TEMP  HEIGHT

   END: 06-08-09  1:40 PM   9199   58634    47.68  -0.022   1.96  77.54   20.78
 START: 06-08-09  1:35 PM   7338   46618    47.52  -0.022   1.96  76.68   16.52
AMOUNT:                     1860   12015
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i215TTYYMMDDHHmmTTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFFf...
                     TTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFFf&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. p - Product Code (single ASCII character [20h-7Eh])
4. dd - Number of Deliveries to follow (Decimal, 00=no data)
5. YYMMDDHHmm - Starting Date/Time
6. YYMMDDHHmm - Ending Date/Time
7. NN - Number of eight character Data Fields to follow (Hex)
8. FFFFFFFF - ASCII Hex IEEE float:
    1. Starting Volume
    2. Starting Mass
    3. Starting Density
    4. Starting Water
    5. Starting Temp
    6. Ending Volume
    7. Ending Mass
    8. Ending Density
    9. Ending Water
    10. Ending Temp
    11. Starting Height
    12. Ending Height
    13. Starting TC Density
    14. Ending TC Density
    15. Starting TC Volume
    16. Ending TC Volume
    17. Starting Total TC Density Offset
    18. Ending Total TC Density Offset
9. f - Default Density Flag (0=new value, 1=default)
10. && - Data Termination Flag
11. CCCC - Message Checksum

Function Code: 21C Version 4
Function Type: Power Outage Delivery Report

Command Format:
Display: <SOH>I21CTT
Computer: <SOH>i21CTT

Typical Response Message, Display Format:

```
<SOH>
I21CTT
 29-07-08 14:58

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

POWER OUTAGE DELIVERY REPORT

TANK    1 PRODUCT 1
INCREASE   DATE     TIME            VOLUME  HEIGHT
      END: 28-07-08 15:14            3231     32.21
    START: 28-07-08 15:05            1244     12.22
   AMOUNT:                           1987

      END: 25-07-08 14:48            4460     44.60
    START: 25-07-08 14:37            1157     11.57
   AMOUNT:                           3303
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i21CTTYYMMDDHHmmTTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFF...
                     TtpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. dd - Number of Deliveries to follow (Decimal, 00 if no data available for this tank)
5. YYMMDDHHmm - Starting Date/Time
6. YYMMDDHHmm - Ending Date/Time
7. NN - Number of eight character Data Fields to follow (Hex)
8. FFFFFFFF - ASCII Hex IEEE float:
   1. Starting Volume
   2. Ending Volume
   3. Starting Height
   4. Ending Height
9. && - Data Termination Flag
10. CCCC - Message Checksum

Function Code: **21E** Version 4
Function Type: Inventory Snapshot Volume

Command Format:
Display: <SOH>I21ETTyymmddhhmm
Computer: <SOH>i21ETTyymmddhhmm

Notes:
1. yymmddhhmm - Request for Inventory records starting with this date to the most recent. If no yymmddhhmm, return the most recent records stored

Typical Response Message, Display Format:

```
<SOH>
I21ETT
JAN 22, 1996  3:06 PM

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

TANK Date/Time         VOLUME TC VOLUME   ULLAGE  HEIGHT    WATER    TEMP
  1  05/01/08 20:30      5329      5413     4699   47.97     0.00   37.39
     05/01/08 19:30      5129      5113     4799   47.97     0.00   37.39
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i21ETTYYMMDDHHmmTTpssssyymmddhhmmNNFFFFFFFF...
                      TTpssssyymmddhhmmNNFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. p - Product Code (one ASCII character [20h-7Eh])
4. ssss - Number of Inventory Records to follow (Decimal)
5. yymmddhhmm - Stored Inventory records Date and Time
6. NN - Number of eight character Data Fields to follow (Hex)
7. FFFFFFFF - ASCII Hex IEEE floats:
   1. Volume
   2. TC Volume
   3. Ullage
   4. Height
   5. Water
   6. Temperature
   7. Water Volume
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **21F** Version 4
Function Type: Manual Shift Inventory Snapshot Report

Command Format:
Display: <SOH>I21Fssdd
Computer: <SOH>i21Fssdd

Notes:
1. ss - number 00=all, 01, 02, 03, 04 shift number (Decimal)
2. dd - number Day of Shift
   00=all days
   01=current day
   02=current day-1
   03=current day-2

Typical Response Message, Display Format:

```
<SOH>
I21F01
 22-05-01 14:56

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

SHIFT 1

TANK TIME           VOLUME TC VOLUME ULLAGE  HEIGHT WATER  TEMP
  1  08-05-15 06:00  8518      8492    1482   76.26  0.00 64.57
  2  08-05-15 06:00  8518      8492    1482   76.26  0.00 64.57
  3  08-05-15 06:00  8518      8492    1482   76.26  0.00 64.57
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i21F00YYMMDDHHmmssCCttpYYMMDDhhmmNNFFFFFFFF...
                          ttpYYMMDDhhmmNNFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. ss - Shift number (Decimal, 01-04, 00=all)
3. CC - Number of Tanks to follow (Decimal)
4. tt - Tank number (Decimal)
5. p - Product Code (single ASCII character, [20h-7Eh)
6. YYMMDDHHmm - Shift Date and Time close for each tank
7. NN - Number of eight character Data Fields to follow (Hex)
8. FFFFFFFF - ASCII Hex IEEE floats:
   1. Volume
   2. TC Volume
   3. Ullage
   4. Height
   5. Water
   6. Temperature
   7. Water Volume
9. && - Data Termination Flag
10. CCCC - Message Checksum

Function Code: 231 Version 5
Function Type: In-Tank Full Inventory Report

Command Format:
Display: <SOH>I231TT
Computer: <SOH>I231TT

Typical Response Message, Display Format:

```
<SOH>
I23100
 16-06-11 07:35

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

FULL INVENTORY REPORT

TANK           :       2       5       6
FULL VOLUME    :   10000   10000   10000
VOLUME         :     247    7433    1828
ULLAGE         :    9753    2567    8172
HEIGHT         :     5.8    16.7    11.4
WATER HEIGHT   :     2.0     2.5     4.8
WATER VOLUME   :      51     560     528
NET VOLUME     :     196    6873    1300
TC VOLUME      :     246    7366    1819
TC NET VOLUME  :     195    6811    1294
TEMP           :    64.5    72.0    66.1
MASS           :       -   45481       -
DENSITY        :       -   45.77       -
TC DENSITY     :       -   46.18       -
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i231TTYYMMDDHHmmTTpssssNNFFFFFFFF...
                      TTpssssNNFFFFFFFF&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. p - Product Code (single ASCII character [20h-7Eh])
4. ssss - Tank Status Bits:
   - Bit 1=(LSB) Delivery in Progress
   - Bit 2=Leak Test in Progress
   - Bit 3=Invalid Fuel Height Alarm (MAG Probes Only)
   - Bit 4-16 - Unused
5. NN - Number of eight character Data Fields to follow (Hex)
6. FFFFFFFF - ASCII Hex IEEE float:
   1. Volume
   2. TC Volume
   3. Ullage
   4. Height
   5. Water
   6. Temperature
   7. Water Volume
   8. Full Volume
   9. Net Volume
   10. TC Net Volume
   11. Mass
   12. Density
   13. TC Density
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: 233 Version 6
Function Type: Density Offset History Report

Command Format:
Display: <SOH>I233TT
Computer: <SOH>I233TT

Typical Response Message, Display Format:

```
<SOH>
I23300
 16-06-11 07:35

DENSITY OFFSET HISTORY REPORT

T 1:REGULAR UNLEADED
DATE / TIME              DENSITY    TEMP  TC DENSITY  TC REF TEMP  TC OFFSET
16-06-11 07:35      TLS:  45.062   71.50      45.459        59.00      0.000
                  FIELD:  45.060   71.50      45.464        59.00      0.005
                  TOTAL:                                               0.005
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i233TTYYMMDDHHmmTTNNYYMMDDHHmmnnFFFFFFFF...FFFFFFFF
                        YYMMDDHHmmnnFFFFFFFF...FFFFFFFF...
                    TTNNYYMMDDHHmmnnFFFFFFFF...FFFFFFFF
                        YYMMDDHHmmnnFFFFFFFF...FFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. NN - Number of Records to follow (Hex)
4. YYMMDDHHmm - Date/Time
5. nn - Number of eight character Data Fields to follow (Hex)
6. FFFFFFFF - ASCII Hex IEEE float:
   1. TLS Density
   2. TLS Temp
   3. TLS TC Density
   4. Previous TC Ref Temp
   5. Previous Total TC Density Offset
   6. Field Density
   7. Field Temp
   8. Field TC Density
   9. TC Ref Temp
   10. TC Density Offset
   11. Total TC Density Offset
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: 234 Version 5
Function Type: In-Tank Mass/Density Inventory Report 2

Command Format:
Display: <SOH>I234TT
Computer: <SOH>I234TT

Typical Response Message, Display Format:

```
<SOH>
I234TT
 04-30-09  2:18 PM

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

IN-TANK MASS INVENTORY
                                                TC       TC
TANK PRODUCT              VOLUME    MASS  DENSITY  OFFSET  HEIGHT  WATER   TEMP
  1  PRODUCT 1              7343   44521    45.35  -0.022    16.5    0.0   78.8
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i234TTYYMMDDHHmmTTpssssNNFFFFFFFF...
                      TTpssssNNFFFFFFFF&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. p - Product Code (single ASCII character [20h-7Eh])
4. ssss - Tank Status Bits:
   - Bit 1=(LSB) Delivery in Progress
   - Bit 2=Leak Test in Progress
   - Bit 3=Invalid Fuel Height Alarm (MAG Probes Only)
   - Bit 4-16 - Unused
5. NN - Number of eight character Data Fields to follow (Hex)
6. FFFFFFFF - ASCII Hex IEEE float:
   1. Volume
   2. Mass
   3. Density
   4. Height
   5. Water
   6. Temperature
   7. TC Density
   8. TC Volume
   9. Ullage
   10. Water Volume
   11. Total TC Density Offset
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: 235 Version 5
Function Type: In-Tank Mass/Density Delivery Report 2

Command Format:
Display: <SOH>I235TT
Computer: <SOH>I235TT

Typical Response Message, Display Format:

```
<SOH>
I235TT
    04-30-09  2:46 PM
T 1:PRODUCT 1                                    TC       TC
INCREASE   DATE / TIME    VOLUME    MASS  DENSITY  OFFSET  WATER   TEMP  HEIGHT

   END: 06-08-09  1:40 PM   9199   58634    47.68  -0.022   1.96  77.54   20.78
 START: 06-08-09  1:35 PM   7338   46618    47.52  -0.022   1.96  76.68   16.52
AMOUNT:                     1860   12015
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i235TTYYMMDDHHmmTTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFFf...
                     TTpddYYMMDDHHmmYYMMDDHHmmNNFFFFFFFFf&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. p - Product Code (single ASCII character [20h-7Eh])
4. dd - Number of Deliveries to follow (Decimal, 00=no data)
5. YYMMDDHHmm - Starting Date/Time
6. YYMMDDHHmm - Ending Date/Time
7. NN - Number of eight character Data Fields to follow (Hex)
8. FFFFFFFF - ASCII Hex IEEE float:
    1. Starting Volume
    2. Starting Mass
    3. Starting Density
    4. Starting Water
    5. Starting Temp
    6. Ending Volume
    7. Ending Mass
    8. Ending Density
    9. Ending Water
    10. Ending Temp
    11. Starting Height
    12. Ending Height
    13. Starting TC Density
    14. Ending TC Density
    15. Starting TC Volume
    16. Ending TC Volume
    17. Starting Total TC Density Offset
    18. Ending Total TC Density Offset
9. f - Default Density Flag (0=new value, 1=default)
10. && - Data Termination Flag
11. CCCC - Message Checksum

7.2.3 I/O DEVICE REPORTS

Function Code: 406 Version 1
Function Type: Relay Status Report

Command Format:
Display: <SOH>I406RR
Computer: <SOH>i406RR

Typical Response Message, Display Format:

```
<SOH>
I40600
 22-05-01 14:57

STATION HEADER 1....
STATION HEADER 2....
STATION HEADER 3....
STATION HEADER 4....

RELAY STATUS: OPEN
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i406RRYYMMDDHHmmRRssss...
                      RRssss&&CCCC<ETX>
Notes:
 1.     YYMMDDHHmm - Current Date and Time
 2.             RR - Relay Number (Decimal, 00 = all)
 3.           ssss - Relay Status:
                        0001 - Relay Open
                        0002 - Relay Closed
 4.             && - Data Termination Flag
 5.           CCCC - Message Checksum
```

7.3 SETUP FUNCTIONS & REPORTS

7.3.1 SYSTEM SETUP

Function Code: **501** Version 1
Function Type: Set Time of day

Command Format:		**Inquire:**
Display:	<SOH>S50100YYMMDDHHmm	<SOH>I50100
Computer:	<SOH>s50100YYMMDDHHmm	<SOH>i50100

Typical Response Message, Display Format:

```
<SOH>
I50100
 22-05-01 14:58

SYSTEM DATE AND TIME
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i50100YYMMDDHHmmYYMMDDHHmm&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. YYMMDDHHmm - Year, Month, Day, Hour and Minute
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **502** Version 1
Function Type: Set Shift Start Time 1, 2, 3, 4

Command Format:		**Inquire:**
Display:	<SOH>S502SSHHmm	<SOH>I502SS
Computer:	<SOH>s502SSHHmm	<SOH>i502SS

Notes:
1. SS - Shift Start time (01, 02, 03, 04)

Typical Response Message, Display Format:

```
<SOH>
I50201
 22-05-01 14:58

SHIFT TIME 1 : DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i502SSYYMMDDHHmmHHmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. HHmm - Hour and Minute (EE00 = Disabled)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **503** Version 1
Function Type: Set Print Header Line 1, 2, 3, 4

Command Format:		**Inquire:**
Display:	<SOH>S503LLaaaaaaaaaaaaaaaaaaaa	<SOH>I503LL
Computer:	<SOH>s503LLaaaaaaaaaaaaaaaaaaaa	<SOH>i503LL

Typical Response Message, Display Format:

```
<SOH>
I50301
 22-05-01 14:58

1:STATION HEADER 1....
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i503LLYYMMDDHHmmaaaaaaaaaaaaaaaaaaaa&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. LL - Header line number 1, 2, 3, 4
3. a - Header Line (20 ASCII characters from 20 Hex - 7E Hex)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **504** Version 1
Function Type: Set System RS-232 Security Code

Command Format:		**Inquire:**
Display:	<SOH>S50400aaaaaa	<SOH>I50400
Computer:	<SOH>s50400aaaaaa	<SOH>i50400

Typical Response Message, Display Format:

```
<SOH>
I50400
 22-05-01 14:58

232 SECURITY CODE

PORT  SECURITY CODE   STATUS

 1         000000    DISABLED
 2         000000    DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i50400YYMMDDHHmmaaaaaa&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. aaaaaa - Security Code (6 ASCII characters from 20 Hex - 7E Hex)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **50C** Version 1
Function Type: Set Printer Page Eject Flag

Command Format:		**Inquire:**
Display:	<SOH>S50C00f	<SOH>I50C00
Computer:	<SOH>s50C00f	<SOH>i50C00

Typical Response Message, Display Format:

```
<SOH>
I50C00
 22-05-01 14:58

PAGE EJECT  : NO
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i50C00YYMMDDHHmmf&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. f - Page Eject Flag:
   0 = Disabled
   1 = Enabled
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **50D** Version 1
Function Type: Set Print Temperature Compensation Flag

Command Format:		**Inquire:**
Display:	<SOH>S50D00f	<SOH>I50D00
Computer:	<SOH>s50D00f	<SOH>i50D00

Typical Response Message, Display Format:

```
<SOH>
I50D00
 22-05-01 14:59

PRINT TC VOLUMES
DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i50D00YYMMDDHHmmf&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. f - Print Temperature Compensation Flag
   0 = Disable
   1 = Enable
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **50E** Version 1
Function Type: Set Temperature Compensation Value

Command Format:		**Inquire:**
Display:	<SOH>S50E00DDD.hh	<SOH>I50E00
Computer:	<SOH>s50E00FFFFFFFF	<SOH>i50E00

Notes:
1. DDD.hh - Compensation Temperature, Degrees and hundredths (Decimal)
2. FFFFFFFF - Compensation Temperature, Degrees (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I50E01
 22-05-01 14:59

TEMP COMPENSATION
VALUE (DEG F ):   59.0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i50E00YYMMDDHHmmFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. FFFFFFFF - Compensation Temperature, Degrees (ASCII Hex IEEE float)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **50F** Version 1
Function Type: Set System Date/Time Display Format

Command Format:		**Inquire:**
Display:	<SOH>S50F00xx	<SOH>I50F00
Computer:	<SOH>s50F00xx	<SOH>i50F00

Typical Response Message, Display Format:

```
<SOH>
I50F00
 22-05-01 14:59

DD-MM-YY HH:MM:SS
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i50F00YYMMDDHHMMxx&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. xx - Display format for DATE/TIME code
   - 01 - MON DD, YYYY HH:MM:SS xM (12 Hour Clock)
   - 02 - MON DD YYYY HH:MM:SS (24 Hour Clock)
   - 03 - MM-DD-YY HH:MM:SS xM (12 Hour Clock)
   - 04 - MM-DD-YY HH:MM:SS (24 Hour Clock)
   - 05 - DD-MM-YY HH:MM:SS (24 Hour Clock)
   - 06 - YY-MM-DD HH:MM:SS (24 Hour Clock)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **514** Version 1
Function Type: Set H-Protocol Height/Volume format

Command Format:		**Inquire:**
Display:	<SOH>S51400f	<SOH>I51400
Computer:	<SOH>s51400f	<SOH>i51400

Typical Response Message, Display Format:

```
<SOH>
I51400
 22-05-01 14:59

H-PROTOCOL DATA FORMAT
HEIGHT
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i51400YYMMDDHHmmf&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. f - Data Format
   0 = Height
   1 = Volume
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **517** Version 1
Function Type: Set System Type & Language Flags

Command Format:		**Inquire:**
Display:	<SOH>S51700ULL	<SOH>I51700
Computer:	<SOH>s51700ULL	<SOH>i51700

Typical Response Message, Display Format:

```
<SOH>
I51700
 22-05-01 14:59

SYSTEM TYPE AND LANGUAGE FLAG

LANG      : ENGLISH
UNITS     : U.S.
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i51700YYMMDDHHmmULL&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. U - System Units:
   1 = U.S.
   2 = Metric
   3 = Imperial Gallons
3. LL - System Language:
   01 = English
   02 = French
   03 = Spanish
   04 = German
   05 = Portuguese
   06 = Polish
   07 = Swedish
   09 = Finnish
   11 = Russian
   12 = Turkish
   14 = Italian
   15 = Chinese
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **51A** Version 1
Function Type: Set Enable/Disable Auto Daylight Saving Time

Command Format:		**Inquire:**
Display:	<SOH>S51A00f	<SOH>I51A00
Computer:	<SOH>s51A00f	<SOH>i51A00

Typical Response Message, Display Format:

```
<SOH>
I51A00
 22-05-01 14:59

DAYLIGHT SAVING TIME
DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i51A00YYMMDDHHmmf&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. f - Daylight Saving Time Flag
   0 = Disabled
   1 = Enabled
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: 51B Version 1
Function Type: Set Start/End Daylight Saving Date and Time

Command Format:		**Inquire:**
Display:	<SOH>S51BttMMWDHHmm	<SOH>I51Btt
Computer:	<SOH>s51BttMMWDHHmm	<SOH>i51Btt

Notes:
1. YYMMDDHHmm - Current Date and Time
2. tt - Start or End Time Indicator
   01=Start Date & Time
   02=End Date & Time
3. MMWDHHmm - Date & Time
   MM=Month (01-12)
   W=Week of Month (1-6)
   D=Day of Week (1=Monday, 2=Tuesday, .. 7=Sunday)
   HH=Hour (00-23)
   mm=Minute (00-59)

Typical Response Message, Display Format:

```
<SOH>
I51B00
 22-05-01 15:02

DAYLIGHT SAVING TIME

START DATE    APR   WEEK 1   SUN   2:00 AM

END DATE      OCT   WEEK 4   SUN   2:00 AM
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i51BttYYMMDDHHmmMMWDHHmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. tt - Start or End Time Indicator
   00=in computer format returns only Start Date & Time
   01=Start Date & Time
   02=End Date & Time
3. MMWDHHmm - Date & Time
   MM=Month (01-12)
   W=Week of Month (1-6)
   D=Day of Week (1=Monday, 2=Tuesday, .. 7=Sunday)
   HH=Hour (00-23)
   mm=Minute (00-59)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **51F** Version 1
Function Type: Set Euro Protocol Prefix

Command Format:		**Inquire:**
Display:	<SOH>S51F00e	<SOH>I51F00
Computer:	<SOH>s51F00e	<SOH>i51F00

Typical Response Message, Display Format:

```
<SOH>
I51F00
 22-05-01 15:02

EURO PROTOCOL PREFIX
S
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i51F00YYMMDDHHmme&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. e - Euro Protocol Prefix
   0 = S
   1 = d
3. && - Data Termination Flag
4. CCCC - Message Checksum

7.3.2 COMMUNICATIONS SETUP

Function Code: **523** Version 1
Function Type: Set Receiver Telephone Number

Command Format:		**Inquire:**
Display:	<SOH>S523RRaaaaaaaaaaaaaaaaaaaa	<SOH>I523RR
Computer:	<SOH>s523RRaaaaaaaaaaaaaaaaaaaa	<SOH>i523RR

Typical Response Message, Display Format:

```
<SOH>
I52301
 22-05-01 15:02

RECEIVER PHONE NUMBER

RCVR   PHONE NUMBER
 1     860-555-2866
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i523RRYYMMDDHHmmRRaaaaaaaaaaaaaaaaaaaa
                      RRaaaaaaaaaaaaaaaaaaaa&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal, 01 only)
3. a - Phone Number (20 ASCII characters from 20 Hex - 7E Hex)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **526** Version 1
Function Type: Set Receiver Retry Number

Command Format:		**Inquire:**
Display:	<SOH>S526RRnn	<SOH>I526RR
Computer:	<SOH>s526RRnn	<SOH>i526RR

Typical Response Message, Display Format:

```
<SOH>
I52601
 22-05-01 15:02

RETRY NUMBER

RCVR   RETRY NUMBER
 1     3
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i526RRYYMMDDHHmmRRnn
                      RRnn&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal, 01 only)
3. nn - Retry Number (03 through 99)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **527** Version 1
Function Type: Set Receiver Retry Delay Time

Command Format:		**Inquire:**
Display:	<SOH>S527RRnn	<SOH>I527RR
Computer:	<SOH>s527RRnn	<SOH>i527RR

Typical Response Message, Display Format:

```
<SOH>
I52701
 22-05-01 15:03

RETRY DELAY TIME

RCVR   RETRY DELAY
 1     3
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i527RRYYMMDDHHmmRRnn
                      RRnn&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal, 01 only)
3. nn - Retry Delay Time (00 to 60 minutes)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **52C** Version 1
Function Type: Set Receiver Auto Dial On Alarms

Command Format:		**Inquire:**
Display:	<SOH>S52CRRAANNTTSS	<SOH>I52CRR
Computer:	<SOH>s52CRRAANNTTSS	<SOH>i52CRR

Typical Response Message, Display Format:

```
<SOH>
I52C01
 22-05-01 15:06

RECEIVER SETUP REPORT

RECEIVER   : 01

IN-TANK ALARMS :
T 1:MAX PRODUCT
T 1:DELIVERY NEEDED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i52CRRYYMMDDHHmmRRnnAANNTTSS...
                      RrnnAANNTTSS...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal, 01 only)
3. nn - Number of Alarms to Follow (Hex)
4. AA - Alarm/Warning Category:
   02 = Tank Alarm
5. NN - Alarm Type Number:
   - If AA is 02 and NN is:
     03 = Tank High Water Alarm
     04 = Tank Overfill Alarm
     05 = Tank Low Product Alarm
     08 = Tank Invalid Fuel Level Alarm
     09 = Tank Probe Out Alarm
     11 = Tank Delivery Needed Warning
     12 = Tank Maximum Product Alarm
     13 = Tank Gross Leak Test Fail Alarm
     14 = Tank Periodic Leak Test Fail Alarm
     15 = Tank Annual Leak Test Fail Alarm
     27 = Tank Cold Temperature Warning
6. TT - Tank/Sensor Number (Decimal, 00 = all)
7. SS - Status (Hex):
   00 = Clear
   01 = Set
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **535** Version 1
Function Type: Set Modem Hangup Method

Command Format:		**Inquire:**
Display:	<SOH>S53500MM	<SOH>I535MM
Computer:	<SOH>s53500MM	<SOH>i535MM

Typical Response Message, Display Format:

```
<SOH>
I53501
 22-05-01 15:06

AUTO COMPUTER MODE HANGUP

RCVR   METHOD
 1     CHARACTER
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i53500YYMMDDHHmm00MM...
                     00MM&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. MM - Hang-up Method:
   00 - Character
   01 - Hangup
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **536** Version 1
Function Type: Set RS-232 Security Code per Port

Command Format:		**Inquire:**
Display:	<SOH>S536PPsaaaaaa	<SOH>I536PP
Computer:	<SOH>s536PPsaaaaaa	<SOH>i536PP

Notes:
1. PP - Port number (Decimal, 01-02; 99=this port)
2. s - Enable or Disable Status (if disabled no password is required)
3. aaaaaa - Security code (6 ASCII characters from 20 hex - 7E Hex)

Typical Response Message, Display Format:

```
<SOH>
I53601
    22-05-01 15:06

232 SECURITY CODE

PORT  SECURITY CODE   STATUS

 1         000000    DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i536PPYYMMDDHHmmsaaaaaa&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. s - Status
   00 = Disabled
   01 = Enabled
3. aaaaaa - Security code (6 ASCII characters from 20 hex - 7E Hex)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: 539 Version 4
Function Type: Set Receiver Auto Dial On Events

Command Format:		**Inquire:**
Display:	<SOH>S539RRAANNTTSS	<SOH>I539RR
Computer:	<SOH>s539RRAANNTTSS	<SOH>i539RR

Typical Response Message, Display Format:

```
<SOH>
I53901
 22-05-01 15:06

RECEIVER EVENTS SETUP REPORT

RECEIVER   : 01

IN-TANK EVENTS :
T 1:SHIFT CLOSE EVENT
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i539RRYYMMDDHHmmRRnnAANNTTSS...
                      RRnnAANNTTSS&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal, 01 only)
3. nn - Number of Events to Follow (Hex)
4. AA - Event Category
   02 - Tank Event
5. NN - Event Type Number:
   - If AA is 02 and NN is:
   01 = Tank Delivery Completed
   02 = Shift Close Event (Version 4)
6. TT - Tank/Sensor Number (Decimal, 00 = all)
7. SS - Status (Hex)
   00 = Clear
   01 = Set
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **545** Version 5
Function Type: Set TC Density Enable

Command Format:		**Inquire:**
Display:	<SOH>S54500f	<SOH>I54500
Computer:	<SOH>s54500f	<SOH>i54500

Typical Response Message, Display Format:

```
<SOH>
I54500
    04-30-09  9:11 AM

TC DENSITY
ENABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i545TTYYMMDDHHmmf&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. f - TC Density Enable Flag
   0 = Disable
   1 = Enable
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **54D** Version 4
Function Type: Set IS03166 3 Character Country Code

Command Format:		**Inquire:**
Display:	<SOH>S54D00aaa	<SOH>I54D00
Computer:	<SOH>s54D00aaa	<SOH>i54D00

Typical Response Message, Display Format:

```
<SOH>
I54D00
APR 10, 2007  10:15 AM

ISO3166 COUNTRY CODE: ESP
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i54D00YYMMDDHHmmaaa&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. aaa - ISO3166 Country Code (3 ASCII characters [20h-7EH])
3. && - Data Termination Flag
4. CCCC - Message Checksum

7.3.3 I/O DEVICE SETUP

Function Code: **55C** Version 1
Function Type: Set Relay Alarm Assignment

Command Format:		**Inquire:**
Display:	<SOH>S55C00M	<SOH>I55C00
Computer:	<SOH>s55C00M	<SOH>i55C00

Typical Response Message, Display Format:

```
<SOH>
I55C01
 22-05-01 15:06

ALARM RELAY : NONE
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i55C00YYMMDDHHmmM&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. M - Relay mode:
   0 = None
   1 = Overfill
   2 = Any Alarm
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **56B** Version 4
Function Type: Set Autodial Confirmation Flag

Command Format:		**Inquire:**
Display:	<SOH>S56BRRf	<SOH>I56BRR
Computer:	<SOH>s56BRRf	<SOH>i56BRR

Typical Response Message, Display Format:

```
<SOH>
I56B01
 22-05-01 15:03

AUTODIAL CONFIRMATION

RCVR   AUTODIAL CONFIRMATION
 1     DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i56BRRYYMMDDHHmmRRf&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal, 01 only)
3. f - Autodial Confirmation Flag
   0=Disabled
   1=Enabled
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **56D** Version 4
Function Type: Set Shift Close Method

Command Format:		**Inquire:**
Display:	<SOH>S56D00M	<SOH>I56D00
Computer:	<SOH>s56D00M	<SOH>i56D00

Typical Response Message, Display Format:

```
<SOH>
I56D00
 22-05-08 15:02

SHIFT CLOSE METHOD : SNAPSHOT
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i56D00YYMMDDHHmmM&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. M - Shift Close Method (Decimal)
   0 = TIMED
   1 = SNAPSHOT
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **56E** Version 4
Function Type: Set Manual Close Timeout

Command Format:		**Inquire:**
Display:	<SOH>S56E00NN	<SOH>I56E00
Computer:	<SOH>s56E00NN	<SOH>i56E00

Typical Response Message, Display Format:

```
<SOH>
I56E00
 22-05-08 15:02

MANUAL CLOSE TIMEOUT

30
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i56D00YYMMDDHHmmNN&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. NN - Number of Minutes (Decimal, [min,max] = [30,60])
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **571** Version 4
Function Type: Set Dial Type

Command Format:		**Inquire:**
Display:	<SOH>S571RRTT	<SOH>I571RR
Computer:	<SOH>s571RRTT	<SOH>i571RR

Typical Response Message, Display Format:

```
<SOH>
I57100
JAN 31, 2008  9:02 AM

DIAL TYPE

RCVR   DIAL TYPE
 1     NONE
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i57100YYMMDDHHmmRRTT&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal)
3. TT - Dial Type
   - 00 = None
   - 01 = Modem
   - 02 = TCPIP
   - 03 = Email
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: 574 Version 5
Function Type: Set Push Site ID Enable

Command Format:		**Inquire:**
Display:	<SOH>S574RRF	<SOH>I574RR
Computer:	<SOH>s574RRF	<SOH>i574RR

Typical Response Message, Display Format:

```
<SOH>
I57400
JUL 8, 2009  9:02 AM

PUSH SITE ID ENABLE

RCVR   PUSH SITE ID
 1     ENABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i57400YYMMDDHHmmRRF&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal)
3. F - Push Site ID Enable Flag
   0 = Disabled
   1 = Enabled
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **575** Version 5
Function Type: Set Dial Type

Command Format:		**Inquire:**
Display:	<SOH>S571RRDDDDDD	<SOH>I571RR
Computer:	<SOH>s571RRHHHHHHHH	<SOH>i571RR

Notes:
1. DDDDDD - Site ID (Decimal)

Typical Response Message, Display Format:

```
<SOH>
I57500
JUL  8, 2009  9:02 AM

SITE ID

RCVR   SITE ID
 1      123456
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i57500YYMMDDHHmmRRHHHHHHHH&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. RR - Receiver Number (Decimal)
3. HHHHHHHH - Site ID (Hex)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **577** Version 4
Function Type: Set Inventory Start Time

Command Format:		**Inquire:**
Display:	<SOH>S57700hhmm	<SOH>I57700
Computer:	<SOH>s57700hhmm	<SOH>i57700

Typical Response Message, Display Format:

```
<SOH>
I577D00
 22-05-08 15:02

INVENTORY LOG TIME : 12:00
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i57700YYMMDDHHmmhhmm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. hhmm - Start Time to Record Inventory [0000-2359] where 0000=midnight (Decimal)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **578** Version 4
Function Type: Set Inventory Repeat Interval

Command Format:		**Inquire:**
Display:	<SOH>S57800rr	<SOH>I57800
Computer:	<SOH>s57800rr	<SOH>i57800

Typical Response Message, Display Format:

```
<SOH>
I57800
22-05-08 15:02

INVENTORY LOG INTERVAL : 1 Hour
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i57800YYMMDDHHmmrr&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. rr - Repeat Time to Record Inventory (Decimal)
   - 0 = 5 Minutes
   - 1 = 10 Minutes
   - 2 = 15 Minutes
   - 3 = 20 Minutes
   - 4 = 30 Minutes
   - 5 = 1 hour
   - 6 = 2 hours
   - 7 = 3 hours
   - 8 = 4 hours
   - 9 = 6 hours
   - 10 = 8 hours
   - 11 = 12 hours
   - 12 = 24 hours
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **579** Version 5
Function Type: Set Tank Idle Delivery Enabled

Command Format:		**Inquire:**
Display:	<SOH>S57900f	<SOH>I57900
Computer:	<SOH>s57900f	<SOH>i57900

Typical Response Message, Display Format:

```
<SOH>
I57900
22-05-08 15:02

TANK IDLE  DELIVERY
ENABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i57900YYMMDDHHmmf&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. f - Tank Idle Delivery flag
   0 = Disabled
   1 = Enabled
3. && - Data Termination Flag
4. CCCC - Message Checksum

7.3.4 IN-TANK SETUP

Function Code: 601 Version 1
Function Type: Set Tank Configuration

Command Format:		**Inquire:**
Display:	<SOH>S601TTf	<SOH>I601TT
Computer:	<SOH>s601TTf	<SOH>i601TT

Typical Response Message, Display Format:

```
<SOH>
I60101
 22-05-01 15:07

TANK CONFIGURATION

DEVICE  LABEL                  CONFIGURED
     1  REGULAR UNLEADED       ON
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i601TTYYMMDDHHmmTTf
                      TTf&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. f - Tank Configuration Flag:
   0 = Off
   1 = On
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **602** Version 1
Function Type: Set Tank Product Label

Command Format:		**Inquire:**
Display:	<SOH>S602TTaaaaaaaaaaaaaaaaaaaa	<SOH>I602TT
Computer:	<SOH>s602TTaaaaaaaaaaaaaaaaaaaa	<SOH>i602TT

Typical Response Message, Display Format:

```
<SOH>
I60201
 22-05-01 15:07

TANK PRODUCT LABEL

TANK   PRODUCT LABEL
 1     REGULAR UNLEADED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i602TTYYMMDDHHmmTTaaaaaaaaaaaaaaaaaaaa
                      TTaaaaaaaaaaaaaaaaaaaa&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. a - Product Label (20 ASCII characters from 20 Hex - 7E Hex)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **604** Version 1
Function Type: Set Tank 1 Point Full Height Volume

Command Format:		**Inquire:**
Display:	<SOH>S604TTGGGGGG	<SOH>I604TT
Computer:	<SOH>s604TTFFFFFFFF	<SOH>i604TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Full Height Volume, Gallons (Decimal)
3. FFFFFFFF - Full Height Volume, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I60401
 22-05-01 15:07

TANK FULL VOLUME

TANK   PRODUCT LABEL             GALLONS
 1     REGULAR UNLEADED           10000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i604TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Full Height Volume, Gallons (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **605** Version 1
Function Type: Set Tank 4 Point Full, 3/4, 1/2, 1/4 Volumes

Command Format:		**Inquire:**
Display:	<SOH>S605TTGGGGGGgggggGGGGGGgggggg	<SOH>I605TT
or:	<SOH>S605TTGGGG,gggg,GGGG,ggg	
Computer:	<SOH>s605TTFFFFFFFFffffffffFFFFFFFFffffffff	<SOH>i605TT

Notes:

1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Full Height Volume, Gallons (Decimal)
3. gggggg - 3/4 Height Volume, Gallons (Decimal)
4. GGGGGG - 1/2 Height Volume, Gallons (Decimal)
5. gggggg - 1/4 Height Volume, Gallons (Decimal)
6. FFFFFFFF - Full Height Volume, Gallons (ASCII Hex IEEE float)
7. ffffffff - 3/4 Height Volume, Gallons (ASCII Hex IEEE float)
8. FFFFFFFF - 1/2 Height Volume, Gallons (ASCII Hex IEEE float)
9. ffffffff - 1/4 Height Volume, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I60501
 22-05-01 15:07

TANK 4 POINT VOLUMES

TANK   PRODUCT LABEL                          GALLONS
 1     REGULAR UNLEADED             10000       0       0       0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i605TTYYMMDDHHmmTTFFFFFFFFffffffffFFFFFFFFffffffff
                      TTFFFFFFFFffffffffFFFFFFFFffffffff&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Full Height Volume, Gallons (ASCII Hex IEEE float)
4. ffffffff - 3/4 Height Volume, Gallons (ASCII Hex IEEE float)
5. FFFFFFFF - 1/2 Height Volume, Gallons (ASCII Hex IEEE float)
6. ffffffff - 1/4 Height Volume, Gallons (ASCII Hex IEEE float)
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: **606** Version 1
Function Type: Set Tank 20 Point Full, 95%, 90%,...Volumes

Command Format:		**Inquire:**
Display:	<SOH>S606TTGGGGGGgggggg...	<SOH>I606TT
or:	<SOH>S606TTGGGG,gggg,GGGG,...	
Computer:	<SOH>s606TTFFFFFFFF...	<SOH>i606TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGGgggggg - Series of 20 Volumes, Gallons (Decimal)
3. FFFFFFFF - Series of 20 Volumes, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I60601
 22-05-01 15:07

TANK 20 POINT VOLUMES

TANK   PRODUCT LABEL                          GALLONS
 1     REGULAR UNLEADED             10000       0       0       0
                                        0       0       0       0
                                        0       0       0       0
                                        0       0       0       0
                                        0       0       0       0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i606TTYYMMDDHHmmTTFFFFFFFF...
                      TTFFFFFFFF...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Series of 20 Volumes, Gallons (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **607** Version 1
Function Type: Set Tank Diameter

Command Format:		**Inquire:**
Display:	<SOH>S607TTIII.hh	<SOH>I607TT
Computer:	<SOH>s607TTFFFFFFFF	<SOH>i607TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. III.hh - Tank Diameter, Inches and hundredths (Decimal)
3. FFFFFFFF - Tank Diameter, Inches (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I60701
 22-05-01 15:07

TANK DIAMETER

TANK   PRODUCT LABEL             INCHES
 1     REGULAR UNLEADED           96.00
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i607TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Tank Diameter, Inches (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **608** Version 1
Function Type: Set Tank Tilt

Command Format:		**Inquire:**
Display:	<SOH>S608TTIII.hh	<SOH>I608TT
Computer:	<SOH>s608TTFFFFFFFF	<SOH>i608TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. III.hh - Tank Tilt, Inches and hundredths (Decimal)
3. FFFFFFFF - Tank Tilt, Inches (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I60801
 22-05-01 15:07

TANK TILT

TANK   PRODUCT LABEL             INCHES
 1     REGULAR UNLEADED            0.00
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i608TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Tank Tilt, Inches (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **609** Version 1
Function Type: Set Tank Thermal Expansion Coefficient

Command Format:		**Inquire:**
Display:	<SOH>S609TTc.cccccc	<SOH>I609TT
Computer:	<SOH>s609TTFFFFFFFF	<SOH>i609TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. c.cccccc - Thermal Expansion Coefficient (decimal)
3. FFFFFFFF - Thermal Expansion Coefficient (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I60901
 22-05-01 15:07

TANK THERMAL COEFFICIENT

TANK   PRODUCT LABEL
 1     REGULAR UNLEADED          0.000651
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i609TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Thermal Expansion Coefficient (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **60A** Version 1
Function Type: Set Tank Linear Calculated Full Volume

Command Format:		**Inquire:**
Display:	<SOH>S60ATTGGGGGG	<SOH>I60ATT
Computer:	<SOH>s60ATTFFFFFFFF	<SOH>i60ATT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Full Height Volume, Gallons (Decimal)
3. FFFFFFFF - Full Height Volume, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I60A01
 22-05-01 15:08

TANK FULL VOLUME

TANK   PRODUCT LABEL          TANK PROFILE   GALLONS
1      REGULAR UNLEADED            1 PT       10000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i60ATTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Full height volume (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: 60B Version 1
Function Type: Set Tank Stick Height Function Enable

Command Format:		**Inquire:**
Display:	<SOH>S60B00f	<SOH>I60B00
Computer:	<SOH>s60B00f	<SOH>i60B00

Typical Response Message, Display Format:

```
<SOH>
I60B01
 22-05-01 15:08

STICK HEIGHT OFFSET ENABLE STATUS
ENABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i60B00YYMMDDHHmmf&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. f - Stick Height Function:
   0 = Disabled
   1 = Enabled
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **60C** Version 1
Function Type: Set Tank Stick Height Offset

Command Format:		**Inquire:**
Display:	<SOH>S60CTTIII.hh	<SOH>I60CTT
Computer:	<SOH>s60CTTFFFFFFFF	<SOH>i60CTT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. III.hh - Stick Height Offset, Inches and hundredths (Decimal)
3. FFFFFFFF - Stick Height Offset, Inches (ASCII Hex IEEE float). Value must be within the range of +144 to -144 inches. It is used to calculate stick height = height (without tilt) + stick offset

Typical Response Message, Display Format:

```
<SOH>
I60C01
 22-05-01 15:08

TANK STICK HEIGHT OFFSET

TANK   PRODUCT LABEL             INCHES
 1     REGULAR UNLEADED            1.25
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i60CTTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Stick Height Offset, Inches (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **60D** Version 1
Function Type: Set Chinese Fixed Product Label

Command Format:		**Inquire:**
Display:	<SOH>S60DTTLL	<SOH>I60DTT
Computer:	<SOH>s60DTTLL	<SOH>i60DTT

Typical Response Message, Display Format:

```
<SOH>
I60D01
 22-05-01 15:08

CHINESE PRODUCT LABEL

TANK 1         0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i60DTTYYMMDDHHmmTTLL&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank number
3. LL - Fixed product label index:
   - 00 = NONE
   - 01 = DIESEL
   - 02 = GASOLINE UNLEADED
   - 03 = SUPER UNLEADED
   - 04 = PREMIUM
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **610** Version 1
Function Type: Set Tank Delivery Delay

Command Format:		**Inquire:**
Display:	<SOH>S610TTdd	<SOH>I610TT
Computer:	<SOH>s610TTdd	<SOH>i610TT

Typical Response Message, Display Format:

```
<SOH>
I61001
 22-05-01 15:08

TANK DELIVERY DELAY

TANK   PRODUCT LABEL
 1     REGULAR UNLEADED          1
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i610TTYYMMDDHHmmTTdd
                      TTdd&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. dd - Indicates the length of time in minutes (01-99)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: 611 Version 1
Function Type: Set Tank Leak Test Type & Start Time

Command Format:			**Inquire:**
Display:	<SOH>S611TTDDRMYYMMDDHHmm<CR>	(if M = 1)	<SOH>I611TT
	MMWDHHmm<CR>	(if M = 2)	
	WDHHmm<CR>	(if M = 3)	
	DHHmm<CR>	(if M = 4)	
	HHmm<CR>	(if M = 5)	
	<CR>	(if M = 6)	
	<CR>	(if M = 7)	
Computer:	<SOH>s611TTDDRMYYMMDDHHmm<CR>	(if M = 1)	<SOH>i611TT
	MMWDHHmm<CR>	(if M = 2)	
	WDHHmm<CR>	(if M = 3)	
	DHHmm<CR>	(if M = 4)	
	HHmm<CR>	(if M = 5)	
	<CR>	(if M = 6)	
	<CR>	(if M = 7)	

Typical Response Message, Display Format:

```
<SOH>
I61101
 22-05-01 15:09

LEAK TEST METHOD

TEST ON DATE : TANK 1
DISABLED

START TIME : DISABLED
TEST RATE  : 0.20 GAL/HR
DURATION   : 2  HOURS

TST EARLY STOP:DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i611TTYYMMDDHHmmTTDDRMYYMMDDHHmm             (if M = 1)
                      MMWDHHmm                    (if M = 2)
                      WDHHmm                      (if M = 3)
                      DHHmm                       (if M = 4)
                      HHmm                        (if M = 5)
                      (none)                      (if M = 6)
                      (none)                      (if M = 7)
                TTDDRMYYMMDDHHmm&&CCCC<ETX>       (if M = 1)
                      MMWDHHmm&&CCCC<ETX>         (if M = 2)
                      WDHHmm&&CCCC<ETX>           (if M = 3)
                      DHHmm&&CCCC<ETX>            (if M = 4)
                      HHmm&&CCCC<ETX>             (if M = 5)
                      &&CCCC<ETX>                 (if M = 6)
                      &&CCCC<ETX>                 (if M = 7)
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. DD - Leak test Duration in hours (2 <= DD <= 24)
4. R - Leak test Rate (0 = 0.2, 1 = 0.1)

Function Code 611 Notes: (Continued)

```
5.              M - Leak test Method:
                       1 = On Date
                       2 = Annually
                       3 = Monthly
                       4 = Weekly
                       5 = Daily

                  - If M = 1 ON DATE, YYMMDDHHmm:
                       YY   = Year
                       MM   = Month (01 - 12)
                       DD   = Day
                       HHmm = Hour, Minute (EE00 = Disabled)

                  - If M = 2 ANNUALLY, MMWDHHmm:
                       MM   = Month (01 - 12)
                       W    = Week Number (1 - 4)
                       D    = Day (1 = Monday, 2 = Tuesday, . . . 7 = Sunday)
                       HHmm = Hour, Minute (EE00 = Disabled)

                  - If M = 3 MONTHLY, WDHHmm:
                       W    = Week Number (1 - 4)
                       D    = Day (1 = Monday, 2 = Tuesday, . . . 7 = Sunday)
                       HHmm = Hour, Minute (EE00 = Disabled)

                  - If M = 4 WEEKLY, DHHmm:
                       D    = Day (1 = Monday, 2 = Tuesday, . . . 7 = Sunday)
                       HHmm = Hour, Minute (EE00 = Disabled)

                  - If M = 5 DAILY, HHmm:
                       HHmm = Hour, Minute (EE00 = Disabled)

6.              && - Data Termination Flag
7.            CCCC - Message Checksum
```

Function Code: **612** Version 1
Function Type: Set Tank Manifolded Partners

Command Format:		**Inquire:**
Display:	<SOH>S612TTttTTtt...<CR>	<SOH>I612TT
Computer:	<SOH>s612TTttTTtt...<CR>	<SOH>i612TT

Typical Response Message, Display Format:

```
<SOH>
I61201
 22-05-01 15:09

TANK MANIFOLDED PARTNERS

TANK   PRODUCT LABEL          MANIFOLDED TANKS
 1     REGULAR UNLEADED           3, 5
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i612TTYYMMDDHHmmTTNNtt...
                      TTNNtt...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Number of the first tank to be manifolded
3. NN - Number of tanks that are manifolded together
4. tt - Tank numbers of other tanks to be manifolded to first tank
5. && - Data Termination Flag
6. CCCC - Message Checksum

Function Code: **61A** Version 1
Function Type: Set In-Tank Leak Test Early Stop

Command Format:		Inquire:
Display:	<SOH>S61ATTf	<SOH>I61ATT
Computer:	<SOH>s61ATTf	<SOH>i61ATT

Typical Response Message, Display Format:

```
<SOH>
I61A01
 22-05-01 15:09

IN-TANK LEAK TEST EARLY STOP

TANK   PRODUCT LABEL          TST EARLY STOP:
 1     REGULAR UNLEADED          DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i6A000YYMMDDHHmmTTf...
                     TTf&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. f - In-Tank Leak Test Early Stop Flag:
   0 = DISABLED
   1 = ENABLED
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **621** Version 1
Function Type: Set Tank Low Level Limit

Command Format:		**Inquire:**
Display:	<SOH>S621TTGGGGGG	<SOH>I621TT
Computer:	<SOH>s621TTFFFFFFFF	<SOH>i621TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Low Level Limit, Gallons (Decimal)
3. FFFFFFFF - Low Level Limit, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I62101
 22-05-01 15:09

TANK LOW PRODUCT LIMIT

TANK   PRODUCT LABEL             GALLONS
 1     REGULAR UNLEADED             800
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i621TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Low Level Limit, Gallons (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **623** Version 1
Function Type: Set Tank Overfill Level Limit

Command Format:		**Inquire:**
Display:	<SOH>S623TTGGGGGG	<SOH>I623TT
Computer:	<SOH>s623TTFFFFFFFF	<SOH>i623TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Overfill Level Limit, Gallons (Decimal)
3. FFFFFFFF - Overfill Level Limit, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I62301
 22-05-01 15:09

TANK OVERFILL LEVEL LIMIT

TANK   PRODUCT LABEL             GALLONS
 1     REGULAR UNLEADED            9604
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i623TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Overfill Level Limit, Gallons (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **624** Version 1
Function Type: Set Tank High Water Level Limit

Command Format:		**Inquire:**
Display:	<SOH>S624TTII.t	<SOH>I624TT
Computer:	<SOH>s624TTFFFFFFFF	<SOH>i624TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. II.t - High Water Level Limit, Inches and tenths (Decimal, Max=05.0)
3. FFFFFFFF - High Water Level Limit, Inches (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I62401
 22-05-01 15:09

TANK HIGH WATER LEVEL LIMIT

TANK   PRODUCT LABEL             INCHES
 1     REGULAR UNLEADED           4.9
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i624TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - High Water Level Limit, Inches (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **628** Version 1
Function Type: Set Tank Maximum Volume Limit

Command Format:		**Inquire:**
Display:	<SOH>S628TTGGGGGG	<SOH>I628TT
Computer:	<SOH>s628TTFFFFFFFF	<SOH>i628TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Maximum Volume Limit, Gallons (Decimal)
3. FFFFFFFF - Maximum Volume Limit, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I62801
 22-05-01 15:10

TANK MAXIMUM VOLUME LIMIT

TANK   PRODUCT LABEL             GALLONS
 1     REGULAR UNLEADED            9800
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i628TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Maximum Volume Limit, Gallons (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **629** Version 1
Function Type: Set Tank Delivery Required Limit

Command Format:		**Inquire:**
Display:	<SOH>S629TTGGGGGG	<SOH>I629TT
Computer:	<SOH>s629TTFFFFFFFF	<SOH>i629TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Delivery Required Limit, Gallons (Decimal)
3. FFFFFFFF - Delivery Required Limit, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I62901
 22-05-01 15:10

TANK DELIVERY REQUIRED LIMIT

TANK   PRODUCT LABEL             GALLONS
 1     REGULAR UNLEADED             900
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i629TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Delivery Required Limit, Gallons (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **62A** Version 1
Function Type: Set Tank Annual Leak Test Minimum Volume

Command Format:		**Inquire:**
Display:	<SOH>S62ATTGGGGGG	<SOH>I62ATT
Computer:	<SOH>s62ATTFFFFFFFF	<SOH>i62ATT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Annual Test Minimum Volume, Gallons (Decimal)
3. FFFFFFFF - Annual Test Minimum Volume, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I62A01
 22-05-01 15:10

ANNUAL LEAK TEST MIN VOLUME

TANK   PRODUCT LABEL             GALLONS
 1     REGULAR UNLEADED               0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i62ATTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Annual Test Minimum Volume, Gallons (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **62D** Version 1
Function Type: Set Enable/Disable Tank Leak Test Fail Alarms

Command Format:		**Inquire:**
Display:	<SOH>S62DTTgpa	<SOH>I62DTT
Computer:	<SOH>s62DTTgpa	<SOH>i62DTT

Typical Response Message, Display Format:

```
<SOH>
I62D01
 22-05-01 15:10

TANK LEAK TEST FAIL ALARMS

TANK   PRODUCT LABEL
 1     REGULAR UNLEADED          GROSS TEST FAIL        DISABLED
                                 PERIODIC TEST FAIL     DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i62DTTYYMMDDHHmmTTgpa
                     TTgpa&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. g - Gross Test Fail Alarm
   0 = Disabled
   1 = Enabled
4. p - Periodic Test Fail Alarm
   0 = Disabled
   1 = Enabled
5. a - Annual Test Fail Alarm
   0 = Disabled
   1 = Enabled
6. && - Data Termination Flag
7. CCCC - Message Checksum

Function Code: **62F** Version 1
Function Type: Set Mag Probe Float Size

Command Format:		**Inquire:**
Display:	<SOH>S62FTTf	<SOH>I62FTT
Computer:	<SOH>s62FTTf	<SOH>i62FTT

Typical Response Message, Display Format:

```
<SOH>
I62F01
 22-05-01 15:10

MAG PROBE FLOAT SIZE

TANK   PRODUCT LABEL              FLOAT SIZE:
 1     REGULAR UNLEADED            2.0 INCHES
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i62FTTYYMMDDHHmmTTf
                     TTf&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. f - Mag Probe Float Size
   0 = 4.0"
   1 = 2.0"
   2 = 3.0"
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **633** Version 1
Function Type: Set Leak Test Report Type

Command Format:		**Inquire:**
Display:	<SOH>S63300f	<SOH>I63300
Computer:	<SOH>s63300f	<SOH>i63300

Typical Response Message, Display Format:

```
<SOH>
I63301
 22-05-01 15:10

LEAK TEST REPORT FORMAT: NORMAL
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i63300YYMMDDHHmmf&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. f - Leak test Report Type:
   0 = Normal
   1 = Enhanced
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **636** Version 1
Function Type: Set Tank Periodic Leak Test Minimum Volume

Command Format:		**Inquire:**
Display:	<SOH>S636TTGGGGGG	<SOH>I636TT
Computer:	<SOH>s636TTFFFFFFFF	<SOH>i636TT

Notes:
1. TT - Tank Number (Decimal, 00 = all)
2. GGGGGG - Periodic Test Minimum Volume, Gallons (Decimal)
3. FFFFFFFF - Periodic Test Minimum Volume, Gallons (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I63601
 22-05-01 15:10

PERIODIC LEAK TEST MIN VOLUME

TANK   PRODUCT LABEL             GALLONS
 1     REGULAR UNLEADED               0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i636TTYYMMDDHHmmTTFFFFFFFF
                      TTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. FFFFFFFF - Periodic Test Minimum Volume, Gallons (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **638** Version 1
Function Type: Set Tank Overfill by Percent

Command Format:		**Inquire:**
Display:	<SOH>S638TTppp	<SOH>I638TT
Computer:	<SOH>s638TTppp	<SOH>i638TT

Typical Response Message, Display Format:

```
<SOH>
I63801
 22-05-01 15:11

TANK OVERFILL LEVEL LIMIT

TANK   PRODUCT LABEL
 1     REGULAR UNLEADED           98 %
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i638TTYYMMDDHHmmTTppp&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank number (Decimal, 00 = all)
3. ppp - Tank Overfill Percent (Decimal, 000 - 100)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **641** Version 5
Function Type: Set Density Code

Command Format:		**Inquire:**
Display:	<SOH>S641TTSSSSSSSSSSSSSS	<SOH>I641TT
Computer:	<SOH>s641TTSSSSSSSSSSSSSS	<SOH>i641TT

Notes:
1. SSSSSSSSSSSSSS - Density Code (This entry should either be exactly 14 characters or empty))
2. - The density code should always start with either ‘A’ or ’B’. The remaining 13 characters should be decimal numbers (0-9) only and no ASCII character is allowed.
3. - If an empty string is entered for set operation (S641TT) then density code will be set to default values.

Typical Response Message, Display Format:

```
<SOH>
I641TT
AUG 15, 2010  3:11 PM

DENSITY FLOAT CODE

TANK   CODE
 1     B7053686719512
 2
 3     A7058696729713
 4     B7056772719214
 5
 6
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i641TTYYMMDDHHmmNNSSSSSSSSSSSSSS…&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. NN - Number of characters to follow
4. SSSSSSSSSSSSSS - Density Code
5. && - Data Termination Flag
6. CCCC - Message Checksum

Function Code: **644** Version 6
Function Type: Set Tank Density Float Serial Number

Command Format:		**Inquire:**
Display:	<SOH>S644TTSSSSSSSS	<SOH>I644TT
Computer:	<SOH>s644TTSSSSSSSS	<SOH>i644TT

Typical Response Message, Display Format:

```
<SOH>
I644TT
AUG 15, 2011  3:11 PM

TANK DENSITY FLOAT SERIAL NUMBER

TANK   PRODUCT LABEL          DENSITY FLOAT S/N
 1     REGULAR UNLEADED       11100123
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i644TTYYMMDDHHmmTTSSSSSSSS...
                      TTSSSSSSSS&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all, inquire only)
3. SSSSSSSS - Density Float Serial Number (Decimal)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **645** Version 6
Function Type: Set Tank GOST Volume Correction Enable

Command Format:		**Inquire:**
Display:	<SOH>S645TTf	<SOH>I645TT
Computer:	<SOH>s645TTf	<SOH>i645TT

Typical Response Message, Display Format:

```
<SOH>
I645TT
AUG 15, 2011  3:11 PM

TANK GOST VOLUME CORRECTION ENABLE

TANK   PRODUCT LABEL          GOST VOLUME CORRECTION
 1     REGULAR UNLEADED       DISABLED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i645TTYYMMDDHHmmTTf...
                      TTf&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. f - GOST Volume Correction Enable Flag
   0 = Disabled
   1 = Enabled
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **647** Version 6
Function Type: Set Tank Multipoint Chart Profile

Command Format:		**Inquire:**
Display:	<SOH>S647TTf	<SOH>I647TT
Computer:	<SOH>s647TTf	<SOH>i647TT

Notes:
1. TT - Tank Number (Decimal, 00 all)
2. f - Enable = ’1’.
   To disable change profile to 1,4,20 points or linear.

Typical Response Message, Display Format:

```
<SOH>
I647TT
AUG 15, 2011  3:11 PM

MULTIPOINT TANK CHART ENABLE

          CHART     NUM      CHART
TANK      VALID    POINTS   ENABLED
   1       YES       400       YES
   2       YES        80        NO
   3       YES       168        NO
   4       YES        50        NO
   5       NO          0        NO
   6       NO          0        NO
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i647TTYYMMDDHHmmTTf...
                     TTf&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. v - Multipoint Tank Chart valid
4. nnnn - Number of points
5. f - Enabled, ‘1’ = yes, ‘0’ = no
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **671** Version 5
Function Type: Set Tank Density High Limit

Command Format:		**Inquire:**
Display:	<SOH>S671TTdd.ddd	<SOH>I671TT
Computer:	<SOH>s671TTFFFFFFFF	<SOH>i671TT

Notes:
1. TT - Tank Number (Decimal, 00=all)
2. dd.ddd - Density High Limit (Decimal)
3. FFFFFFFF - Density High Limit (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I671TT
04-30-09  9:11 AM

TANK DENSITY HIGH LIMIT

TANK   PRODUCT LABEL
 1     PRODUCT 1                56.185
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i671TTYYMMDDHHmmTTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. FFFFFFFF - Density High Limit (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **672** Version 5
Function Type: Set Tank Density Low Limit

Command Format:		**Inquire:**
Display:	<SOH>S672TTdd.ddd	<SOH>I672TT
Computer:	<SOH>s672TTFFFFFFFF	<SOH>i672TT

Notes:
1. TT - Tank Number (Decimal, 00=all)
2. dd.ddd - Density Low Limit (Decimal)
3. FFFFFFFF - Density Low Limit (ASCII Hex IEEE float)

Typical Response Message, Display Format:

```
<SOH>
I672TT
    04-30-09  9:11 AM

TANK DENSITY LOW LIMIT

TANK   PRODUCT LABEL
 1     PRODUCT 1                42.139
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i672TTYYMMDDHHmmTTFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. FFFFFFFF - Density Low Limit (ASCII Hex IEEE float)
4. && - Data Termination Flag
5. CCCC - Message Checksum

7.3.5 MISCELLANEOUS SETUP

Function Code: **854** Version 1
Function Type: Set Immediate Non-volatile RAM Store

Command Format:		**Inquire:**
Display:	<SOH>S85400ss149	<SOH>I85400
Computer:	<SOH>s85400ss149	<SOH>i85400

Notes:
1. ss - Save set up data Flag (see below)
2. 149 - This verification code must be sent to confirm the command

Typical Response Message, Display Format:

```
<SOH>
I85400
 22-05-01 15:11

SAVE SETUP DATA: IDLE
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i85400YYMMDDHHmmss&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. ss - Save set up data Flag:
   - 00 = Idle
   - 01 = Store setup
   - 02 = Restore setup
   - 03 = Store delivery
   - 04 = Restore delivery
   - 05 = Store leak test history
   - 06 = Restore leak test history
   - 07 = Store shift history
   - 08 = Restore shift history
   - 09 = Store alarm history
   - 10 = Restore alarm history
   - 11 = Store miscellaneous history
   - 12 = Restore miscellaneous history
   - 13 = Ram clear initialize
   - 14 = Ram clear
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **881** Version 1
Function Type: Set Communication Port Data

Command Format:		**Inquire:**
Display:	<SOH>S881PPBBBBBPSDTAA	<SOH>I881PP
Computer:	<SOH>s881PPBBBBBPSDTAA	<SOH>i881PP

Notes:
1. PP - Communication Port Number (Decimal 01-05). Inquiry commands work for all 5 ports (Decimal 01-05). Set commands only work for the first 3 ports (Decimal 01-03).

Typical Response Message, Display Format:

```
<SOH>
I88101
 22-05-01 15:11
PORT SETTINGS:

COMM 1 : SERIAL

232 SECURITY CODE : 000000
STATUS            : DISABLED

BAUD RATE   : 9600
PARITY      : ODD
STOP BIT    : 1
DATA LENGTH : 7

HANDSHAKE   : NONE
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i881PPYYMMDDHHmmPPBBBBBPSDTAA&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. BBBBB - Baud Rate (Decimal)
3. P - Parity (Decimal; 0=None, 1 or 2)
4. S - Stop Bit (Decimal; 1 or 2)
5. D - Data Bit (Decimal; 7 or 8)
6. T - Pulse or Tone (Decimal; 0=Tone, 1=Pulse)
7. AA - Number of Rings before Answer (Decimal)
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **882** Version 1
Function Type: Initialize Communication Port Data

Command Format:		**Inquire:**
Display:	<SOH>S882PP149	<SOH>I882PP
Computer:	<SOH>s882PP149	<SOH>i882PP

Notes:
1. PP - Communication Port Number (Decimal 01-05). Inquiry and set commands work for all 5 ports (Decimal 01-05).
2. 149 - This verification code must be sent to confirm the command.

Typical Response Message, Display Format:

```
<SOH>
I88201
 22-05-01 15:11
PORT SETTINGS:

COMM 1 : SERIAL

232 SECURITY CODE : 000000
STATUS            : DISABLED

BAUD RATE   : 9600
PARITY      : ODD
STOP BIT    : 1
DATA LENGTH : 7

HANDSHAKE   : NONE
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i882PPYYMMDDHHmmPPBBBBBPSDTAA&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. BBBBB - Baud Rate (Decimal)
3. P - Parity (Decimal; 0=None, 1 or 2)
4. S - Stop Bit (Decimal; 1 or 2)
5. D - Data Bit (Decimal; 7 or 8)
6. T - Pulse or Tone (Decimal; 0=Tone, 1=Pulse)
7. AA - Number of Rings before Answer (Decimal)
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **883** Version 1
Function Type: Set Serial Communication Language

Command Format:		**Inquire:**
Display:	<SOH>S88300LL	<SOH>I88300
Computer:	<SOH>s88300LL	<SOH>i88300

Typical Response Message, Display Format:

```
<SOH>
I88301
 22-05-01 15:11

SERIAL LANGUAGE

LANG      : ENGLISH
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i883YYMMDDHHmmLL&&CCCC<ETX>
```

Notes:

1. MMDDYYHHmm - Current Date and time
2. LL - Serial Communication Language:
   - 01 = English
   - 02 = French
   - 03 = Spanish
   - 04 = German
   - 05 = Portuguese
   - 06 = Polish
   - 07 = Swedish
   - 09 = Finnish
   - 11 = Russian
   - 12 = Turkish
   - 14 = Italian
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **884** Version 1
Function Type: Set Serial Handshaking Method

Command Format:		**Inquire:**
Display:	<SOH>S88400f	<SOH>I88400
Computer:	<SOH>s88400f	<SOH>i88400

Notes:
1. Inquiry and Set commands work for the first 3 ports (Decimal 01-03). The ports can be set to the following values:
   Port 1: 0 = None, 1 = XON/XOFF, 2 = Hardware
   Port 2 & 3: 0 = None, 1 = XON/XOFF

Typical Response Message, Display Format:

```
<SOH>
I88401
 22-05-01 15:11

HANDSHAKE   : NONE
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i88400YYMMDDHHmmf&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. f - Handshaking Flag: Sets handshaking method for port on which command is received
   0 = None
   1 = XON/XOFF
   2 = Hardware
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **885** Version 1
Function Type: Set Modem Type

Command Format:		**Inquire:**
Display:	<SOH>S885PPMM	<SOH>I885PP
Computer:	<SOH>s885PPMM	<SOH>i885PP

Notes:
1. PP - Communication Port Number (Decimal 01 - 02)

Typical Response Message, Display Format:

```
<SOH>
I88501
 22-05-01 15:11

COMM BOARD : 1
MODEM TYPE : OTHER
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i885PPYYMMDDHHmmMM&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. MM - Modem Type:
   02 = OTHER
   03 = US ROBOTICS
   04 = ZOOM
   05 = serial TCPIP (Version 4)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **886** Version 1
Function Type: Set Modem Dial-In Setup String

Command Format:		**Inquire:**
Display:	<SOH>S886PPaaaaaaaaaaaaaaaaaaaa	<SOH>I886PP
Computer:	<SOH>s886PPaaaaaaaaaaaaaaaaaaaa	<SOH>i886PP

Notes:
1. PP - Communication Port Number (Decimal 01 only)

Typical Response Message, Display Format:

```
<SOH>
I88601
 22-05-01 15:11

COMM BOARD           : 1
MODEM SETUP STRING   :
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i886PPYYMMDDHHmmaaaaaaaaaaaaaaaaaaaa&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. a - Modem Setup String (20 ASCII characters)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **88A** Version 1
Function Type: Set Communications Port Type

Command Format:		**Inquire:**
Display:	<SOH>S88APPt	<SOH>I88APP
Computer:	<SOH>s88APPt	<SOH>i88APP

Notes:
1. PP - Communication Port Number (Decimal 01-03) Inquiry and Set commands work for the first 3 ports (Decimal 01-03). The ports can be set to the following values:
   Port 1: 0 = Printer, 1 = Modem, 2 = Serial, 3 = None
   Port 2 & 3: 2 = Serial, 3 = None

Typical Response Message, Display Format:

```
<SOH>
I88A01
 22-05-01 15:12

PORT COMMUNICATIONS TYPE

COMM 1: SERIAL
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i88APPYYMMDDHHmmt&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. t - Communications Port Type:
   0 = Printer
   1 = Modem
   2 = Serial
   3 = None
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **88B** Version 1
Function Type: Set Printer Language

Command Format:		**Inquire:**
Display:	<SOH>S88BPPll	<SOH>I88BPP
Computer:	<SOH>s88BPPll	<SOH>i88BPP

Notes:
1. PP - Communication Port Number (Decimal 01 - 03)

Typical Response Message, Display Format:

```
<SOH>
I88B01
 22-05-01 15:12

PORT PRINTER LANGUAGE

COMM 1: EPSON ESC/P
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i88BPPYYMMDDHHmmll&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. ll - Printer language:
   00 = EPSON
   01 = IBM
   02 = PU_414
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **88C** Version 1
Function Type: Set Modem Dial-Out Setup String

Command Format:		**Inquire:**
Display:	<SOH>S88CPPaaaaaaaaaaaaaaaaaaaa	<SOH>I88CPP
Computer:	<SOH>s88CPPaaaaaaaaaaaaaaaaaaaa	<SOH>i88CPP

Notes:
1. PP - Communication Port Number (Decimal 01 - 02)

Typical Response Message, Display Format:

```
<SOH>
I88C01
 22-05-01 15:12

COMM BOARD           : 1
MODEM SETUP STRING   :
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i88CPPYYMMDDHHmmaaaaaaaaaaaaaaaaaaaa&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. a - Dial Out String (20 ASCII characters)
3. && - Data Termination Flag
4. CCCC - Message Checksum

Function Code: **893** Version 4
Function Type: Acknowledge Tank Event Ready Status

Command Format:		**Inquire:**
Display:	<SOH>S89300149	<SOH>I89300
Computer:	<SOH>s89300149	<SOH>i89300

Notes:
1. 149 - This verification code must be sent to confirm the command

Typical Response Message, Display Format:

<SOH>
I89300
22-05-01 14:58

Tank	Delivery Ready	Shift Ready	Alarm Notice
1	Yes	No	No
2	No	No	No

<ETX>

Typical Response Message, Computer Format:

<SOH>i89300YYMMDDHHmmNNttnndsa...
NNttnndsa&&CCCC<ETX>

Notes:
1. YYMMDDHHmm - Current Date and Time
2. NN - Number of Tanks to follow (Decimal)
3. tt - Tank Number (Decimal)
4. nn - Number of Events to follow (Decimal)
5. d - Delivery Ready Status (0=not ready, 1=Ready)
6. s - Shift Ready Status (0=not ready, 1-4[shift number]=Ready)
7. a - Alarm Notice Status (0=not ready, 1=Ready)
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **8C0** Version 4
Function Type: TCP/IP Parameter Inquiry

Command Format:
Display: <SOH>I8C000
Computer: <SOH>i8C000

Typical Response Message, Display Format:

```
<SOH>
I8C000
JAN 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

HOST IP ADDRESS:     10.2.1.51
GATEWAY IP ADDRESS:  10.2.1.2
SUBNET MASK ADDRESS: 255.255.255.0
HOST PORT NUMBER:    10001
REMOTE IP ADDRESS:   10.2.2.5
REMOTE PORT NUMBER:  1200
EMAIL RECIPIENT 1:   JOHNDOE@VEEDER.COM
EMAIL RECIPIENT 2:   JANEDOE@VEEDER.COM
EMAIL FROM:          MYTLS2
MAIL SERVER ADDRESS: 10.2.1.50
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i8C000YYMMDDHHmmvhhhhhhhhggggggggssssssssppppaaaaaaaaPPPP
                      RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
                      rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr
                      ffffffffffffffffffffffmmmmmmmm&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. hhhhhhhh - Host IP Address (ASCII hex, two digits represent each field)
4. gggggggg - Gateway IP Address (ASCII hex, two digits represent each field)
5. ssssssss - Subnet Mask (ASCII hex, two digits represent each field)
6. pppp - Host Port (ASCII Hex)
7. aaaaaaaa - Remote Address (ASCII hex, two digits represents each field)
8. PPPP - Remote Port (ASCII Hex)
9. R - Email Recipient 1 (41 ASCII characters [20h-7Eh])
10. r - Email Recipient 2 (41 ASCII characters [20h-7Eh])
11. f - Email From (23 ASCII characters [20h-7Eh])
12. mmmmmmmm - Email Mail Server IP Address (ASCII hex, two digits represent each field)
13. && - Data Termination Flag
14. CCCC - Message Checksum

Function Code: **8C1** Version 4
Function Type: Set TCP/IP Host Address

Command Format:		**Inquire:**
Display:	<SOH>S8C100aaa.aaa.aaa.aaa	<SOH>I8C100
Computer:	<SOH>s8C100AAAAAAAA	<SOH>i8C100

Notes:
1. aaa.aaa.aaa.aaa - Host IP Address (decimal)
2. AAAAAAAA - Host IP Address (ASCII hex, two digits represent each field)

Typical Response Message, Display Format:

```
<SOH>
S8C100
JUL 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

HOST IP ADDRESS:     10.2.1.51
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C100YYMMDDHHmmvAAAAAAAA&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. AAAAAAAA - Host IP Address (ASCII hex, two digits represent each field)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8C2** Version 4
Function Type: Set TCP/IP Gateway IP Address

Command Format:		**Inquire:**
Display:	<SOH>S8C200aaa.aaa.aaa.aaa	<SOH>I8C200
Computer:	<SOH>s8C200AAAAAAAA	<SOH>i8C200

Notes:
1. aaa.aaa.aaa.aaa - Gateway IP Address (decimal)
2. AAAAAAAA - Gateway IP Address (ASCII hex, two digits represent each field)

Typical Response Message, Display Format:

```
<SOH>
S8C200
JUL 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

GATEWAY IP ADDRESS:  10.2.1.2
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C200YYMMDDHHmmvAAAAAAAA&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. AAAAAAAA - Gateway IP Address (ASCII hex, two digits represent each field)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8C3** Version 4
Function Type: Set TCP/IP Subnet Mask Address

Command Format:		**Inquire:**
Display:	<SOH>S8C300aaa.aaa.aaa.aaa	<SOH>I8C300
Computer:	<SOH>s8C300AAAAAAAA	<SOH>i8C300

Notes:
1. aaa.aaa.aaa.aaa - Subnet Mask Address (decimal)
2. AAAAAAAA - Subnet Mask IP Address (ASCII hex, two digits represent each field)

Typical Response Message, Display Format:

```
<SOH>
S8C300
JUL 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

SUBNET MASK ADDRESS: 255.255.255.0
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C300YYMMDDHHmmvAAAAAAAA&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. AAAAAAAA - Subnet Mask (ASCII hex, two digits represent each field)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8C4** Version 4
Function Type: Set TCP/IP Host Port Number

Command Format:		**Inquire:**
Display:	<SOH>S8C400PPPPP	<SOH>I8C400
Computer:	<SOH>s8C400pppp	<SOH>i8C400

Notes:
1. PPPPP - Host Port (decimal)
2. pppp - Host Port (ASCII Hex)

Typical Response Message, Display Format:

```
<SOH>
S8C400
JUL 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

HOST PORT NUMBER:    10001
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C400YYMMDDHHmmvpppp&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. pppp - Host Port (ASCII Hex)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8C5** Version 4
Function Type: Set TCP/IP Remote IP Address

Command Format:		**Inquire:**
Display:	<SOH>S8C500aaa.aaa.aaa.aaa	<SOH>I8C500
Computer:	<SOH>s8C500AAAAAAAA	<SOH>i8C500

Notes:
1. aaa.aaa.aaa.aaa - Remote Address (decimal)
2. AAAAAAAA - Remote Address (ASCII hex, two digits represent each field)

Typical Response Message, Display Format:

```
<SOH>
S8C500
JAN 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

REMOTE IP ADDRESS:   10.2.2.5
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C500YYMMDDHHmmvAAAAAAAA&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. AAAAAAAA - Remote Address (ASCII hex, two digits represent each field)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8C6** Version 4
Function Type: Set TCP/IP Remote Port Number

Command Format:		**Inquire:**
Display:	<SOH>S8C600PPPPP	<SOH>I8C600
Computer:	<SOH>s8C600pppp	<SOH>i8C600

Notes:
1. PPPPP - Remote Port (decimal)
2. pppp - Remote Port (ASCII Hex)

Typical Response Message, Display Format:

```
<SOH>
S8C600
JAN 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

REMOTE PORT NUMBER:  1200
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C600YYMMDDHHmmvpppp&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. pppp - Remote Port (ASCII Hex)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8C7** Version 4
Function Type: Set Email Recipient 1

Command Format:		**Inquire:**
Display:	<SOH>S8C700r..r	<SOH>I8C700
Computer:	<SOH>s8C700r..r	<SOH>i8C700

Typical Response Message, Display Format:

```
<SOH>
I8C700
JAN 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

EMAIL RECIPIENT 1:   JOHNDOE@VEEDER.COM
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C700YYMMDDHHmmvrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. r - Email Recipient 1 (41 ASCII characters [20h-7Eh])
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8C8** Version 4
Function Type: Set Email Recipient 2

Command Format:		**Inquire:**
Display:	<SOH>S8C800r..r	<SOH>I8C800
Computer:	<SOH>s8C800r..r	<SOH>i8C800

Typical Response Message, Display Format:

```
<SOH>
I8C800
JAN 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

EMAIL RECIPIENT 2:   JANEDOE@VEEDER.COM
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C800YYMMDDHHmmvrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. r - Email Recipient 2 (41 ASCII characters [20h-7Eh])
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8C9** Version 4
Function Type: Set Email From

Command Format:		**Inquire:**
Display:	<SOH>S8C900ffffffffffffffffffffff	<SOH>I8C900
Computer:	<SOH>s8C900ffffffffffffffffffffff	<SOH>i8C900

Typical Response Message, Display Format:

```
<SOH>
I8C900
JAN 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

EMAIL FROM:          MYTLS2
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8C900YYMMDDHHmmvfffffffffffffffffffffff&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. f - Email From (23 ASCII characters [20h-7Eh])
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8CA** Version 4
Function Type: Set Email Mail Server IP Address

Command Format:		**Inquire:**
Display:	<SOH>S8CA00aaa.aaa.aaa.aaa	<SOH>I8CA00
Computer:	<SOH>s8CA00AAAAAAAA	<SOH>i8CA00

Notes:
1. aaa.aaa.aaa.aaa - Email Mail Server IP Address (decimal)
2. AAAAAAAA - Email Mail Server IP Address (ASCII hex, two digits represent each field)

Typical Response Message, Display Format:

```
<SOH>
I8CA00
JAN 31, 2008  9:02 AM

TCPIP SETUP PARAMETERS

MAIL SERVER ADDRESS: 10.2.1.50
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8CA00YYMMDDHHmmvAAAAAAAA&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. v - Valid Data Flag
   0 = Not Valid
   1 = Valid
3. AAAAAAAA - Email Mail Server IP Address (ASCII hex, two digits represent each field)
4. && - Data Termination Flag
5. CCCC - Message Checksum

Function Code: **8CB** Version 4
Function Type: TCP/IP Save Setup

Command Format:
Display: <SOH>S8CB00149
Computer: <SOH>s8CB00149

Notes:
1. 149 - code must be sent to confirm the command
2. ??? - TCP/IP Setup not saved successfully

Typical Response Message, Display Format:

```
<SOH>
S8CB00
JUL 31, 2008  9:02 AM

TCPIP SETUP SAVED
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>s8CB00YYMMDDHHmmk&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. k - Status Flag
   0 = TCP/IP Setup not saved successfully
   1 = TCP/IP Setup saved successfully
3. && - Data Termination Flag
4. CCCC - Message Checksum

7.4 DIAGNOSTIC REPORTS

7.4.1 SYSTEM DIAGNOSTIC REPORTS

Function Code: 902 Version 1
Function Type: System Revision Level Report

Command Format:
Display: <SOH>I90200
Computer: <SOH>i90200

Typical Response Message, Display Format:

```
<SOH>
I90200
 22-05-01 15:12
SOFTWARE# 349783-001-AXM
CREATED - 01.05.17.15.11

SYSTEM FEATURES:
PERIODIC IN-TANK TESTS
ANNUAL IN-TANK TESTS
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i90200YYMMDDHHmmSOFTWARE# nnnnnn-vvv-rrrCREATED - YY.MM.DD.HH.mm&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. nnnnnn-vvv - Software version number (ASCII text string)
3. rrr - Software revision level (ASCII text string)
4. YY.MM.DD.HH.mm - Date and time of software creation
5. && - Data Termination Flag
6. CCCC - Message Checksum

Function Code: 905 Version 1
Function Type: System Revision Level Report II

Command Format:
Display: <SOH>I90500
Computer: <SOH>i90500

Typical Response Message, Display Format:

```
<SOH>
I90500
 22-05-01 15:12
SOFTWARE# 349783-001-AXM
CREATED - 01.05.17.15.11

SYSTEM FEATURES:
PERIODIC IN-TANK TESTS
ANNUAL IN-TANK TESTS
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i90500YYMMDDHHmmSOFTWARE# 346abb-Tvv-rrrCREATED - YY.MM.DD.HH.mm
                      nnAABBCCDDEEFFGGHHIIJJS-MODULE# nnnnnn-vvv-r&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. 346 - Software Base number (fixed)
3. a - Platform
   - 0 = Standard CPU, PLLD only
   - 1 = Enhanced CPU
   - 2 = (Unused)
   - 3 = Enhanced CPU 16 Tank
   - 4 = Standard CPU without PLLD & WPLLD
   - 5 = Standard CPU, WPLLD only
4. bb - Version level (eg version "15")
5. T - Software Type
   - 1 = "Real"
   - 2 = "Demo"
   - 3 = "IFSF"
6. vv - Language
   - 00 = English/Spanish
   - 01 = English/French
   - 02 = English/German
   - 03 = English/Swedish
   - 04 = English/Portuguese
   - 05 = English/Polish
   - 06 = English/Finnish
   - 07 = English/Japanese
   - 08 = English/Greek
   - 09 = English/Russian
   - 10 = English/Turkish
   - 11 = English/Dutch
   - 12 = English/Italian
   - 99 = English only
7. rrr - Revision level (eg revision "AX1")
8. YY.MM.DD.HH.mm - Date and time of software creation

Function Code 905 Notes: (Continued)

```
 9.             nn - number of 2 byte values to follow (Hex)
10.             AA - PERIODIC IN-TANK TESTS (00 = DISABLE, 01 = ENABLE)
11.             BB - ANNUAL IN-TANK TESTS (00 = DISABLE, 01 = ENABLE)
12.             CC - CSLD (00 = DISABLE, 01 = ENABLE)
13.             DD - BIR (00 = DISABLE, 01 = ENABLE)
14.             EE - FUEL MANAGER (00 = DISABLE, 01 = ENABLE)
15.             FF - PRECISION PLLD (00 = DISABLE, 01 = ENABLE)
16.             GG - TANKER LOAD (00 = DISABLE, 01 = ENABLE)
17.             HH - 0.2 GPH PLLD (00 = DISABLE, 01 = ENABLE)
18.             II - PRECISION PLLD ON DEMAND (00 = DISABLE, 01 = ENABLE)
19.             JJ - SPECIAL 3-TANK/LINE CONSOLE (00 = DISABLE, 01 = ENABLE)

20.   nnnnnn-vvv-r - SEM Info 3 parts, if none "NO SOFTWARE MODULE"
21.         nnnnnn - SEM number (ASCII text string)
22.            vvv - SEM Software version number (ASCII text string)
23.              r - SEM Software revision level (ASCII text string)

24.             && - Data Termination Flag
25.           CCCC - Message Checksum
```

Function Code: **90F** Version 5
Function Type: Setup Password Log In Status

Command Format:
Display: <SOH>I90F00
Computer: <SOH>i90F00

Typical Response Message, Display Format:

```
<SOH>
I90F00
    07-12-09 09:43

SETUP PASSWORD LOG IN STATUS

SETUP PASSWORD: ENABLED

COMM 1: LOGGED IN
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>i90F00YYMMDDHHmmPpS&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. P - Setup Password Status
   0 = Disabled
   1 = Enabled
3. p - Port Number
4. S - Log In Status
   0 = Logged Out
   1 = Logged In
4. && - Data Termination Flag
5. CCCC - Message Checksum

7.4.2 IN-TANK DIAGNOSTIC REPORTS

Function Code: A01 Version 1
Function Type: Probe Type and Serial Number

Command Format:
Display: <SOH>IA01TT
Computer: <SOH>iA01TT

Typical Response Message, Display Format:

```
<SOH>
IA0101
 22-05-01 15:12
                                TYPE   CODE   LENGTH  SERIAL NO. D/CODE  OPT
TANK  1  REGULAR UNLEADED       MAG    C001   96.00   123001     0000   0x0000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA01TTYYMMDDHHmmTTpPPKKKKFFFFFFFFSSSSSScccc
                      TTpPPKKKKFFFFFFFFSSSSSScccc&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. KKKK - Circuit Code (Hex)
6. FFFFFFFF - Probe Length (ASCII Hex IEEE float)
7. SSSSSS - Probe Serial Number (Decimal)
8. cccc - Probe Date Code (Hex)
9. && - Data Termination Flag
10. CCCC - Message Checksum

Function Code: **A02** Version 1
Function Type: Probe Factory Calibration Values

Command Format:
Display: <SOH>IA02TT
Computer: <SOH>iA02TT

Typical Response Message, Display Format:

```
<SOH>
IA0201
 22-05-01 15:12
TANK  1  REGULAR UNLEADED      MAG     GRADIENT =  180.0000 OPT= 0x0000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA02TTYYMMDDHHmmTTpPPNNFFFFFFFF...
                      TTpPPNNFFFFFFFF...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. NN - Number of eight character Data Fields to follow (Hex)
6. FFFFFFFF - Probe Data (ASCII Hex IEEE float)
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: **A10** Version 1
Function Type: Probe Last Sample Buffers

Command Format:
Display: <SOH>IA10TT
Computer: <SOH>iA10TT

Typical Response Message, Display Format:

```
<SOH>
IA1001
 22-05-01 15:13
TANK  1  REGULAR UNLEADED      MAG    NUMBER OF SAMPLES =     1
  569.000 13584.000 13584.000 13584.000 13584.000 13585.000 13585.000 13584.000
13584.000 13585.000 13584.000 40000.000 21993.000 21993.000 21993.000 21993.000
21993.000 21993.000 40000.000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA10TTYYMMDDHHmmTTpPPSSSSNNFFFFFFFF...
                     TTpPPSSSSNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. SSSS - Sample Number (Hex)
6. NN - Number of eight character Data Fields to follow (Hex)
7. FFFFFFFF - Probe Data (ASCII Hex IEEE float)
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **A11** Version 1
Function Type: Probe Fast Average Buffers

Command Format:
Display: <SOH>IA11TT
Computer: <SOH>iA11TT

Typical Response Message, Display Format:

```
<SOH>
IA1101
 22-05-01 15:13
TANK  1  REGULAR UNLEADED      MAG    NUMBER OF SAMPLES =     5
  569.000 13584.000 13584.000 13584.000 13584.000 13585.000 13585.000 13584.000
13584.000 13585.000 13584.000 40000.000 21993.000 21993.000 21993.000 21993.000
21993.000 21993.000 40000.000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA11TTYYMMDDHHmmTTpPPSSSSNNFFFFFFFF...
                      TTpPPSSSSNNFFFFFFFF...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. SSSS - Number of Samples (Hex)
6. NN - Number of eight character Data Fields to follow (Hex)
7. FFFFFFFF - Probe Data (ASCII Hex IEEE float)
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **A12** Version 1
Function Type: Probe Standard Average Buffers

Command Format:
Display: <SOH>IA12TT
Computer: <SOH>iA12TT

Typical Response Message, Display Format:

```
<SOH>
IA1201
 22-05-01 15:13
TANK  1  REGULAR UNLEADED      MAG    NUMBER OF SAMPLES =    20
  569.000 13584.000 13584.000 13584.000 13584.000 13585.000 13585.000 13584.000
13584.000 13585.000 13584.000 40000.000 21993.000 21993.000 21993.000 21993.000
21993.000 21993.000 40000.000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA12TTYYMMDDHHmmTTpPPSSSSNNFFFFFFFF...
                     TTpPPSSSSNNFFFFFFFF...&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. SSSS - Number of Samples (Hex)
6. NN - Number of eight character Data Fields to follow (Hex)
7. FFFFFFFF - Probe Data (ASCII Hex IEEE float)
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: A13 Version 1
Function Type: Probe Long Term Average Buffers

Command Format:
Display: <SOH>IA13TT
Computer: <SOH>iA13TT

Typical Response Message, Display Format:

```
<SOH>
IA1301
 22-05-01 15:13
TANK  1  REGULAR UNLEADED      MAG    NUMBER OF SAMPLES =   424
  569.000 13584.000 13584.000 13584.000 13584.000 13585.000 13585.000 13584.000
13584.000 13585.000 13584.000 40000.000 21993.000 21993.000 21993.000 21993.000
21993.000 21993.000 40000.000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA13TTYYMMDDHHmmTTpPPSSSSNNFFFFFFFF...
                     TTpPPSSSSNNFFFFFFFF...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. SSSS - Number of Samples (Hex)
6. NN - Number of eight character Data Fields to follow (Hex)
7. FFFFFFFF - Probe Data (ASCII Hex IEEE float)
8. && - Data Termination Flag
9. CCCC - Message Checksum

Function Code: **A14** Version 1
Function Type: Mag Probe Option Table

Command Format:
Display: <SOH>IA14TT
Computer: <SOH>iA14TT

Typical Response Message, Display Format:

```
<SOH>
IA1401
 22-05-01 15:13

MAG PROBE OPTIONS TABLE

TNK   LOW
NUM  TEMP

 1   NO
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA14TTYYMMDDHHmmTTNNL...
                      TTNNL...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. NN - Number of option flags to follow
4. L - Low temperature capability
   0 = NO
   1 = YES
5. && - Data Termination Flag
6. CCCC - Message Checksum

Function Code: **A18** Version 4
Function Type: Probe Diagnostic Printout

Command Format:
Display: <SOH>IA18TT
Computer: <SOH>iA18TT

Typical Response Message, Display Format:

```
<SOH>
IA1801

22-05-01 15:13
DIAGNOSTICS

SOFTWARE REVISION  349783-001-B

TANK             :  1
PROBE TYPE       :  MAG1
SERIAL NUMBER    :  168809
PROBE ID         :  0XC000
PROBE LENGTH     :  30.00
GRADIENT         :  354.520
NUMBER SAMPLES   :  20
SAMPLES READ     :  47357
SAMPLES USED     :  47348
REF DISTANCE     :  08-21-08 102.00
                    08-27-08 102.00
TEMP 6           :  72.6
TEMP 5           :  72.1
TEMP 4           :  70.9
TEMP 3           :  69.4
TEMP 2           :  68.3
TEMP 1           :  67.6
TEMP 6 – TEMP 5  :  0.5
TEMP 5 – TEMP 4  :  1.3
TEMP 4 – TEMP 3  :  1.5
TEMP 3 – TEMP 2  :  1.1
TEMP 2 – TEMP 1  :  0.7
COUNTS 00        :  001319
COUNTS 01        :  007412
COUNTS 02        :  007412
COUNTS 03        :  007412
COUNTS 04        :  007412
COUNTS 05        :  007412
COUNTS 06        :  007412
COUNTS 07        :  007412
COUNTS 08        :  007412
COUNTS 09        :  007412
COUNTS 10        :  007412
COUNTS 11        :  044368
COUNTS 12        :  016952
COUNTS 13        :  017295
COUNTS 14        :  017435
```

Function Code A18 Typical Response Message, Display Format: (Continued)

```
COUNTS 15       :  017389
COUNTS 16       :  017468
COUNTS 17       :  017460
COUNTS 18       :  044370
OPTIONS CODE    :  0X0000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA18TTYYMMDDHHmmTTppppsssssszzzzlllllllllggggggggSSSSSSSS
                        rrrrrrruuuuuuuuYYMMDDhhhhhhhhYYMMDDkkkkkkkk
                        AAaaaaaaaa... aaaaaaaaBBbbbbbbbb...bbbbbbbb
                        NNccccccccc...ccccccccKKKKKKKK
                      TTppppsssssszzzzlllllllllggggggggSSSSSSSS
                        rrrrrrruuuuuuuuYYMMDDhhhhhhhhYYMMDDkkkkkkkk
                        AAaaaaaaaa... aaaaaaaaBBbbbbbbbb...bbbbbbbb
                        NNccccccccc...ccccccccKKKKKKKK&&CCCC<ETX>
```

Notes:

1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00=all)
3. pppp - Probe Type (Hex)
4. ssssss - Serial Number (Decimal)
5. zzzz - Probe ID (Hex)
6. llllllll - Probe Length (ASCII Hex IEEE float)
7. gggggggg - Gradient (ASCII Hex IEEE float)
8. SSSSSSSS - Number of Samples (Hex)
9. rrrrrrrr - Samples Read (Hex)
10. uuuuuuuu - Samples Used (Hex)
11. YYMMDD - Original Reference Distance Date
12. hhhhhhhh - Original Reference Distance Value (ASCII Hex IEEE float)
13. YYMMDD - Current Reference Distance Date
14. kkkkkkkk - Current Reference Distance Value (ASCII Hex IEEE float)
15. AA - # of 8-Byte Temperature Sensor Values to Follow (Hex)
16. aaaaaaaa - Temperature Sensor Values (ASCII Hex IEEE float)
17. BB - # of 8-Byte Temperature Sensor Difference Values to Follow (Hex)
18. bbbbbbbb - Temperature Sensor Difference Values (ASCII Hex IEEE float)
19. NN - # of 8-Byte Channel Count Values to Follow (Hex)
20. cccccccc - Channel Count Values (ASCII Hex IEEE float)
21. KKKKKKKK - Probe Options Code (ASCII-Hex unsigned long)
    0=Standard Temperature Probe
    1=Low Temperature Probe
22. && - Data Termination Flag
23. CCCC - Message Checksum

Function Code: **A20** Version 1
Function Type: Probe Leak Test Flags - Present Test

Command Format:
Display: <SOH>IA20TT
Computer: <SOH>iA20TT

Typical Response Message, Display Format:

```
<SOH>
IA2001
 22-05-01 15:13
TANK  1  REGULAR UNLEADED      MAG    PRESENT LEAK TEST ANALYSIS REPORT
   0.10 GAL/HR FLAGS:
   0.20 GAL/HR FLAGS:
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA20TTYYMMDDHHmmTTpPPNNFFFF...
                     TTpPPNNFFFF...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. NN - Number of 4-character Flag sequences to follow (Hex)
6. FFFF - Flag sequence characters indicating which Flag bits are set
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: **A21** Version 1
Function Type: Probe Leak Test Flags - Stored Test

Command Format:
Display: <SOH>IA21TT
Computer: <SOH>iA21TT

Typical Response Message, Display Format:

```
<SOH>
IA2101
 22-05-01 15:13
TANK  1  REGULAR UNLEADED      MAG    STORED LEAK TEST ANALYSIS REPORT
   0.10 GAL/HR FLAGS:
   0.20 GAL/HR FLAGS:
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA21TTYYMMDDHHmmTTpPPNNFFFF...
                     TTpPPNNFFFF...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. NN - Number of 4-character Flag sequences to follow (Hex)
6. FFFF - Flag sequence characters indicating which Flag bits are set
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: **A22** Version 1
Function Type: Probe Leak Test Flags - Gross Test

Command Format:
Display: <SOH>IA22TT
Computer: <SOH>iA22TT

Typical Response Message, Display Format:

```
<SOH>
IA2201
 22-05-01 15:13
TANK  1  REGULAR UNLEADED      MAG    GROSS LEAK TEST ANALYSIS REPORT

   GROSS LEAK TEST FLAGS:
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA22TTYYMMDDHHmmTTpPPNNFFFF...
                     TTpPPNNFFFF...&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. p - Product Code (single ASCII character, from 20 Hex - 7E Hex)
4. PP - Probe Type:
   00 - Unknown (no further data follows for this probe)
   03 - MAG
5. NN - Number of 4-character Flag sequences to follow (Hex)
6. FFFF - Flag sequence characters indicating which Flag bits are set
7. && - Data Termination Flag
8. CCCC - Message Checksum

Function Code: **A30** Version 1
Function Type: Get Tank Profile and Full Volume

Command Format:
Display: <SOH>IA30TT
Computer: <SOH>iA30TT

Typical Response Message, Display Format:

```
<SOH>
IA3001
 22-05-01 15:13

TANK FULL VOLUME

TANK   PRODUCT LABEL          TANK PROFILE   GALLONS
1      REGULAR UNLEADED            1 PT       10000
<ETX>
```

Typical Response Message, Computer Format:

```
<SOH>iA30TTYYMMDDHHmmTTppFFFFFFFF
                      TTppFFFFFFFF&&CCCC<ETX>
```

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. pp - Profile (HEX)
   00 = 1 point
   01 = 4 point
   02 = Linear
   03 = 20 point
4. FFFFFFFF - Full height volume (ASCII Hex IEEE float)
5. && - Data Termination Flag
6. CCCC - Message checksum

Function Code: A31 Version 6
Function Type: Multipoint Tank Chart Report

Command Format:
Display: <SOH>IA31TT
Computer: <SOH>iA31TT

Typical Response Message, Display Format:

<SOH>
IA3101
AUG 22, 2011 3:12 PM

MULTIPOINT TANK CHART

TANK 1: SUPER DUPER

HEIGHT MM	VOLUME LITERS	HEIGHT MM	VOLUME LITERS	HEIGHT MM	VOLUME LITERS
0	0.000	480	4800.000	960	9600.000
10	100.000	490	4900.000	970	9700.000
20	200.000	500	5000.000	980	9800.000
30	300.000	510	5100.000	990	9900.000
40	400.000	520	5200.000	1000	10000.000
50	500.000	530	5300.000	1010	10100.000
60	600.000	540	5400.000	1020	10200.000
:	:	:	:	:	:
:	:	:	:	:	:
:	:	:	:	:	:

<ETX>

Typical Response Message, Computer Format:

<SOH>iA31TTYYMMDDHHmmTTnnnnhhhhhhhhhhhhhhhhVVVVVVVVVVVVVVVV...
hhhhhhhhhhhhhhhhVVVVVVVVVVVVVVVV&&CCCC<ETX>

Notes:
1. YYMMDDHHmm - Current Date and Time
2. TT - Tank Number (Decimal, 00 = all)
3. nnnn - Number of points to follow, (ASCII Hex)
4. hhhhhhhhhhhhhhhh- Height, ASCII-HEX Double Float, mm or inches
5. VVVVVVVVVVVVVVVV- Volume, ASCII-HEX Double Float, liters or gallons
6. && - Data Termination Flag
7. CCCC - Message checksum

7.5 MISCELLANEOUS

7.5.1 MISCELLANEOUS

Function Code: **D01** Version 5
Function Type: Push Site ID

Command Format:
Display: This command is only sent out by the TLS2P
Computer:

Typical Response Message, Display Format:

Computer format only

Typical Response Message, Computer Format:

<SOH>iD0100YYMMDDHHmmDDDDDD000000&&CCCC<ETX>

Notes:
1. YYMMDDHHmm - Current Date and Time
2. DDDDDD - Site ID (Decimal)
3. 000000 - 6 Zeros
4. && - Data Termination Flag
5. CCCC - Message checksum

Function Code: **D02** Version 5
Function Type: Server Heartbeat

Command Format:
Display:
Computer: <SOH>iD0200cccc

Typical Response Message, Display Format:

Computer format only

Typical Response Message, Computer Format:

<SOH>iD0200YYMMDDHHmmcccc&&CCCC<ETX>

Notes:
1. YYMMDDHHmm - Current Date and Time
2. cccc - Heartbeat Characters (ASCII characters [20h-7Eh])
3. && - Data Termination Flag
4. CCCC - Message checksum

8.0 FUNCTION CODE SUMMARY

CONTROL FUNCTIONS (7.1)

Code	Ver	Function
001	1	System Reset
003	1	Remote Alarm Reset
010	1	Computer Mode Autodial Hang-up
052	1	Start In-Tank Leak Detect Test
053	1	Stop In-Tank Leak Detect Test
09E	5	Password Log In
09F	5	Password Log Out

OPERATIONAL REPORTS (7.2)

SYSTEM REPORTS (7.2.1)

Code	Ver	Function
101	1	System Status Report
103	4	System Identification Report
111	1	Priority Alarm History Report
112	1	Non-Priority Alarm History Report
113	1	Active Alarm Report
114	1	Cleared Alarm Report
117	1	Priority Alarm History Report II
118	1	Non-Priority Alarm History Report II

IN-TANK REPORTS (7.2.2)

Code	Ver	Function
201	1	In-Tank Inventory Report
202	1	In-Tank Delivery Report
203	1	In-Tank Leak Detect Report
204	1	In-Tank Shift Inventory Report
205	1	In-Tank Status Report
206	1	In-Tank Alarm History Report
207	1	In-Tank Leak Test History Report
208	1	In-Tank Leak Test Results Report
209	1	In-Tank Enhanced Leak Detect Report
20C	1	In-Tank Most Recent Delivery Report
20D	1	In-Tank Stick Height Report
214	5	In-Tank Mass / Density Inventory Report
215	5	In-Tank Mass / Density Delivery Report

IN-TANK REPORTS (7.2.2) (Continued)

Code	Ver	Function
21C	4	Power Outage Delivery Report
21E	4	Inventory Snaphot Volume
21F	4	Manual Shift Inventory Snapshot Report
231	5	In-Tank Full Inventory Report
233	6	Density Offset History Report
234	5	In-Tank Mass / Density Inventory Report 2
235	5	In-Tank Mass / Density Delivery Report 2

I/O DEVICE REPORTS (7.2.3)

Code	Ver	Function
406	1	Relay Status Report

SETUP FUNCTIONS & REPORTS (7.3)

SYSTEM SETUP (7.3.1)

Code	Ver	Function
501	1	Set Time of day
502	1	Set Shift Start Time 1, 2, 3, 4
503	1	Set Print Header Line 1, 2, 3, 4
504	1	Set System RS-232 Security Code
50C	1	Set Printer Page Eject Flag
50D	1	Set Print Temperature Compensation Flag
50E	1	Set Temperature Compensation Value
50F	1	Set System Date/Time Display Format
514	1	Set H-Protocol Height/Volume format
517	1	Set System Type & Language Flags
51A	1	Set Enable/Disable Auto Daylight Saving Time
51B	1	Set Start/End Daylight Saving Date and Time
51F	1	Set Euro Protocol Prefix

COMMUNICATIONS SETUP (7.3.2)

Code	Ver	Function
523	1	Set Receiver Telephone Number
526	1	Set Receiver Retry Number
527	1	Set Receiver Retry Delay Time
52C	1	Set Receiver Auto Dial On Alarms
535	1	Set Modem Hangup Method

COMMUNICATIONS SETUP (7.3.2) (Continued)

Code	Ver	Function
536	1	Set RS-232 Security Code per Port
539	4	Set Receiver Auto Dial On Events
545	5	Set TC Density Enable
54D	4	Set IS03166 3 Character Country Code

I/O DEVICE SETUP (7.3.3)

Code	Ver	Function
55C	1	Set Relay Alarm Assignment
56B	4	Set Autodial Confirmation Flag
56D	4	Set Shift Close Method
56E	4	Set Manual Close Timeout
571	4	Set Dial Type
574	5	Set Push Site ID Enable
575	5	Set Dial Type
577	4	Set Inventory Start Time
578	4	Set Inventory Repeat Interval
579	5	Set Tank Idle Delivery Enabled

IN-TANK SETUP (7.3.4)

Code	Ver	Function
601	1	Set Tank Configuration
602	1	Set Tank Product Label
604	1	Set Tank 1 Point Full Height Volume
605	1	Set Tank 4 Point Full, 3/4, 1/2, 1/4 Volumes
606	1	Set Tank 20 Point Full, 95%, 90%,...Volumes
607	1	Set Tank Diameter
608	1	Set Tank Tilt
609	1	Set Tank Thermal Expansion Coefficient
60A	1	Set Tank Linear Calculated Full Volume
60B	1	Set Tank Stick Height Function Enable
60C	1	Set Tank Stick Height Offset
60D	1	Set Chinese Fixed Product Label
610	1	Set Tank Delivery Delay
611	1	Set Tank Leak Test Type & Start Time
612	1	Set Tank Manifolded Partners
61A	1	Set In-Tank Leak Test Early Stop
621	1	Set Tank Low Level Limit
623	1	Set Tank Overfill Level Limit

IN-TANK SETUP (7.3.4) (Continued)

Code	Ver	Function
624	1	Set Tank High Water Level Limit
628	1	Set Tank Maximum Volume Limit
629	1	Set Tank Delivery Required Limit
62A	1	Set Tank Annual Leak Test Minimum Volume
62D	1	Set Enable/Disable Tank Leak Test Fail Alarms
62F	1	Set Mag Probe Float Size
633	1	Set Leak Test Report Type
636	1	Set Tank Periodic Leak Test Minimum Volume
638	1	Set Tank Overfill by Percent
641	5	Set Density Code
644	6	Set Tank Density Float Serial Number
645	6	Set Tank GOST Volume Correction Enable
647	6	Set Tank Multipoint Chart Profile
671	5	Set Tank Density High Limit
672	5	Set Tank Density Low Limit

MISCELLANEOUS SETUP (7.3.5)

Code	Ver	Function
854	1	Set Immediate Non-volatile RAM Store
881	1	Set Communication Port Data
882	1	Initialize Communication Port Data
883	1	Set Serial Communication Language
884	1	Set Serial Handshaking Method
885	1	Set Modem Type
886	1	Set Modem Dial-In Setup String
88A	1	Set Communications Port Type
88B	1	Set Printer Language
88C	1	Set Modem Dial-Out Setup String
893	4	Acknowledge Tank Event Ready Status
8C0	4	TCP/IP Parameter Inquiry
8C1	4	Set TCP/IP Host Address
8C2	4	Set TCP/IP Gateway IP Address
8C3	4	Set TCP/IP Subnet Mask Address
8C4	4	Set TCP/IP Host Port Number
8C5	4	Set TCP/IP Remote IP Address
8C6	4	Set TCP/IP Remote Port Number
8C7	4	Set Email Recipient 1

MISCELLANEOUS SETUP (7.3.5) (Continued)

Code	Ver	Function
8C8	4	Set Email Recipient 2
8C9	4	Set Email From
8CA	4	Set Email Mail Server IP Address
8CB	4	TCP/IP Save Setup

DIAGNOSTIC REPORTS (7.4)

SYSTEM DIAGNOSTIC REPORTS (7.4.1)

Code	Ver	Function
902	1	System Revision Level Report
905	1	System Revision Level Report II
90F	5	Password Log In Status

IN-TANK DIAGNOSTIC REPORTS (7.4.2)

Code	Ver	Function
A01	1	Probe Type and Serial Number
A02	1	Probe Factory Calibration Values
A10	1	Probe Last Sample Buffers
A11	1	Probe Fast Average Buffers
A12	1	Probe Standard Average Buffers
A13	1	Probe Long Term Average Buffers
A14	1	Mag Probe Option Table
A18	4	Probe Diagnostic Printout
A20	1	Probe Leak Test Flags - Present Test
A21	1	Probe Leak Test Flags - Stored Test
A22	1	Probe Leak Test Flags - Gross Test
A30	1	Get Tank Profile and Full Volume
A31	6	Multipoint Tank Chart Report

MISCELLANEOUS REPORTS (7.5)

MISCELLANEOUS REPORTS (7.5.1)

Code	Ver	Function
D01	5	Push Site ID
D02	5	Server Heartbeat

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