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A Sierra Monitor Company

Driver Manual
(Supplement to the FieldServer Instruction Manual)

FS-8700-41 Simplex Time Recorder Company - 4100 Computer Port Protocol

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after May 1, 2001

Driver Version:	**1.07**
Document Revision:	**8**

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1. Simplex Time Recorder Company - 4100 Computer Port Protocol

The Simplex Time Recorder Company - 4100 Computer Port Protocol driver allows the FieldServer to transfer data to and from devices over either RS-232 or RS-485 using Simplex Time Recorder Company - 4100 Computer Port Protocol.

This driver is designed to connect to a Simplex 4100 panel equipped to support the "4100 Computer Port Protocol" as defined in Simplex's document 950-004 Revision E dated 28 July 2000. The implementation provides a selected subset of protocol functions and subset of functionality for each of these selected functions. It is important to note the exclusions and limitations described in this document.

The driver is a capable of parsing and storing information sent by a panel in the form of unsolicited messages which are typically generated when there is a state change in the panel or one of the connected devices. The driver is also capable of polling for point and panel status data and some additional data such as the panel's time and revision information. In addition the driver is capable of setting some control points in the panel – acknowledging and resetting alarms and writing data (where permitted) to some analog and discrete points.

This is a client only driver and is not capable of emulating a Simplex Panel. Server emulation is provided for test purposes only and is not supported or documented.

1.1. Supported Panel Types

The driver has been tested against 4020, 4100 and 4100U panels. There is no difference in the protocol format between the various panels. What changes is the panel firmware version and with the firmware changes the supported function set changes.

1.2. Simplex Panel Firmware Revision vs. Supported Functionality

This driver was primarily tested against a 4020 panel with firmware revision 9.2. Beta testing against a 4100 panel with a firmware revision 10.x was also performed.

A grid of firmware revision number and supported functions is provided by Simplex. This grid is available from Simplex. Request the 'CPP Revision Compatibility' Table.

All the functions described in this manual are supported for firmware revisions 10 or higher. For revisions between 9.2 and 10, the 'Earths' and 'Value' functions described in this driver are not supported by the Simplex Panels. For revisions lower than 9.2, then functions supported need to be determined by trial and error. We are fairly confident that all the functions supported by version 9x are also supported by versions 8x of the panel firmware.

2. Driver Scope of Supply

2.1. Supplied by FieldServer Technologies for this driver

FieldServer Technologies PART #	Description
FS-8917-16	Ethernet Cable with pigtail (4020 and 4100 Panels)
FS-8917-07	Ethernet cable with 25 pin male connector. (4100u Panels)
SPA59132	RS-485 connection adapter
FS-8700-41	Driver Manual.

2.2. Provided by Supplier of 3rd Party Equipment

To enable the 4100 Protocol, the 4100 system, supplied by the user, must have a free RS-232 port dedicated for use with the computer device. In most cases, this is not included in the base configuration of the product provided by The Simplex Time Recorder Company, and must be added as a sales option. All 4100 systems limit the number of computer ports active at one time in a system. To determine the limit for the specific product configuration, refer to the specific product specifications, or contact a Simplex sales representative.

3. Hardware Connections

The FieldServer is connected to the Simplex Device's RS-232 port of device type "COMPUTER", the following port attributes may be configured specifically for that particular port:

Ensure that these settings correspond to the settings described in section 4 of this document.

Sim4100 Panel

Setting	Default	Options
Baud Rate	9600	75, 110, 134.5, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19200
Parity	EVEN[1]	ODD, EVEN, MARK, SPACE, NONE
Data Bits	8	7 or 8
Stop Bits	1	1 or 2

Sim4100U Panel

Setting	Default	Options
Baud Rate	9600	75, 110, 134.5, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19200
Parity	NONE[1]	ODD, EVEN, MARK, SPACE, NONE
Data Bits	8	7 or 8
Stop Bits	1	1 or 2

The following are the Simplex, recommended connections to be used in cabling between the 4100 and the FieldServer device. For the computer device, the standard EIA signal description, and the 25 pin (DB25) and 9 pin (DB9) connector assignments are shown.

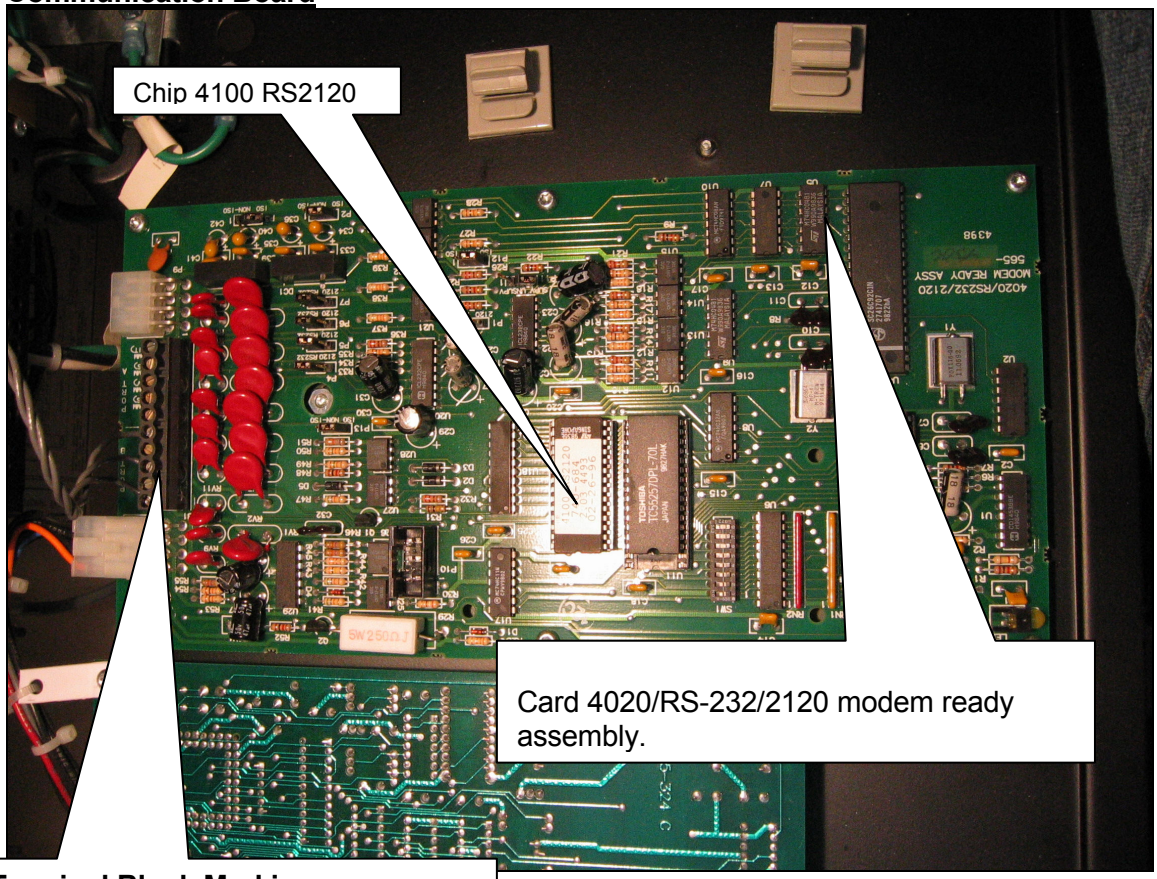
4100 Host				Cable	Computer		
4100			Signal		Signal	DB25Pin	DB9Pin
Port ATB1	Port BTB2	DB25 Pin					
8	1	2	TXD	→	RXD	2	2
6	3	3	RXD	←	TXD	3	3
7	2	4	RTS	[2]	RTS	4	7
5	4	5	CTS		CTS	5	8
4	5	7	GND	──	GND	7	5

[1] Odd or Even parity is recommended (by Simplex) to provide additional error detection at the character level.

[2] Note, that if HSHAKE is not used (Simplex Device Setting), the connections between RTS and CTS are not required

3.1. Connection to a Simplex 4020 Panel

Communication Board

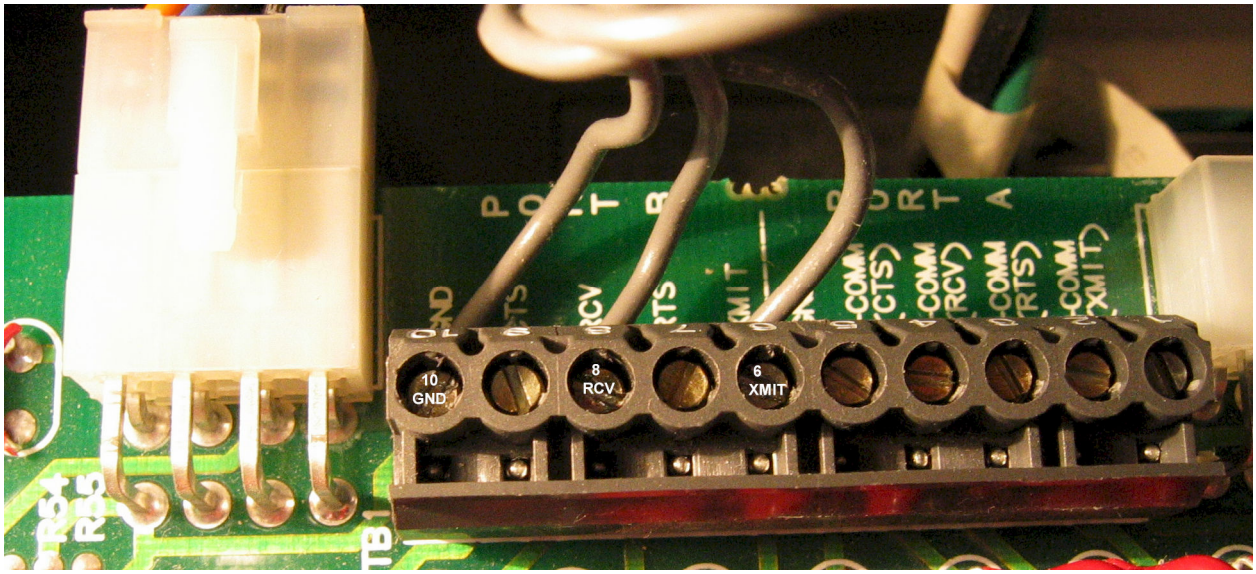


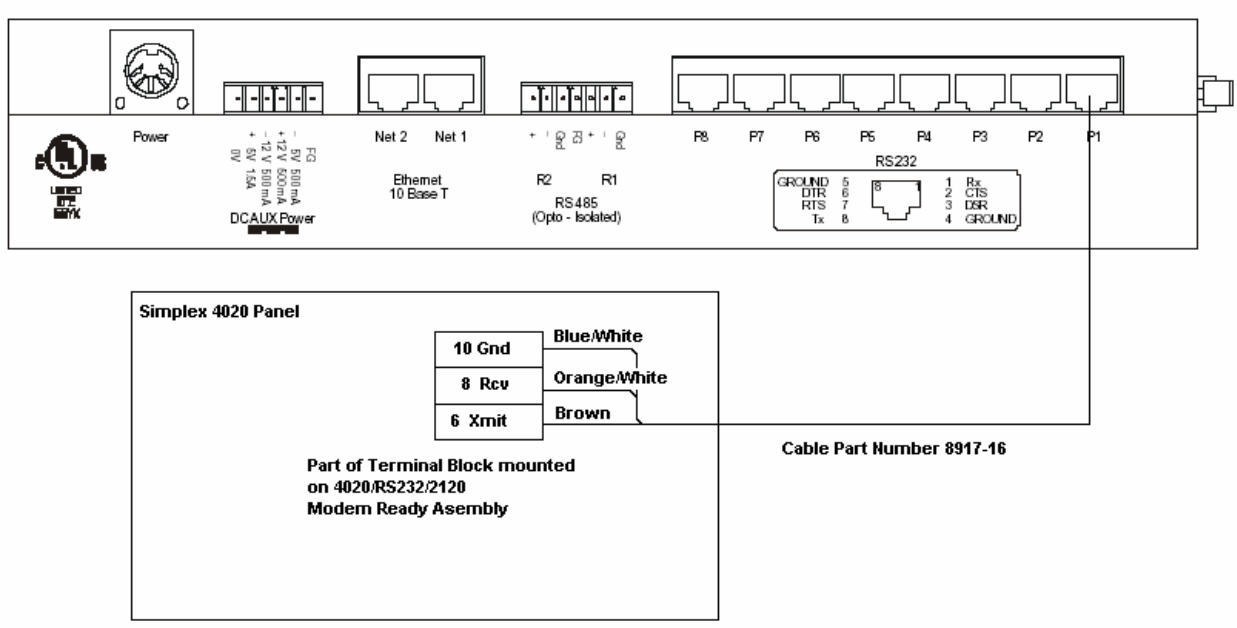
Terminal Block Markings

Port A =1-5, Port B=6-10.

1=+com(xmt).
2=+com(rts),
3=-com(rcv),
4=-com(cts),
5=gnd,
6=xmt,
7=rts,
8=rcv,
9=cts,
10=gnd,

Serial Connection

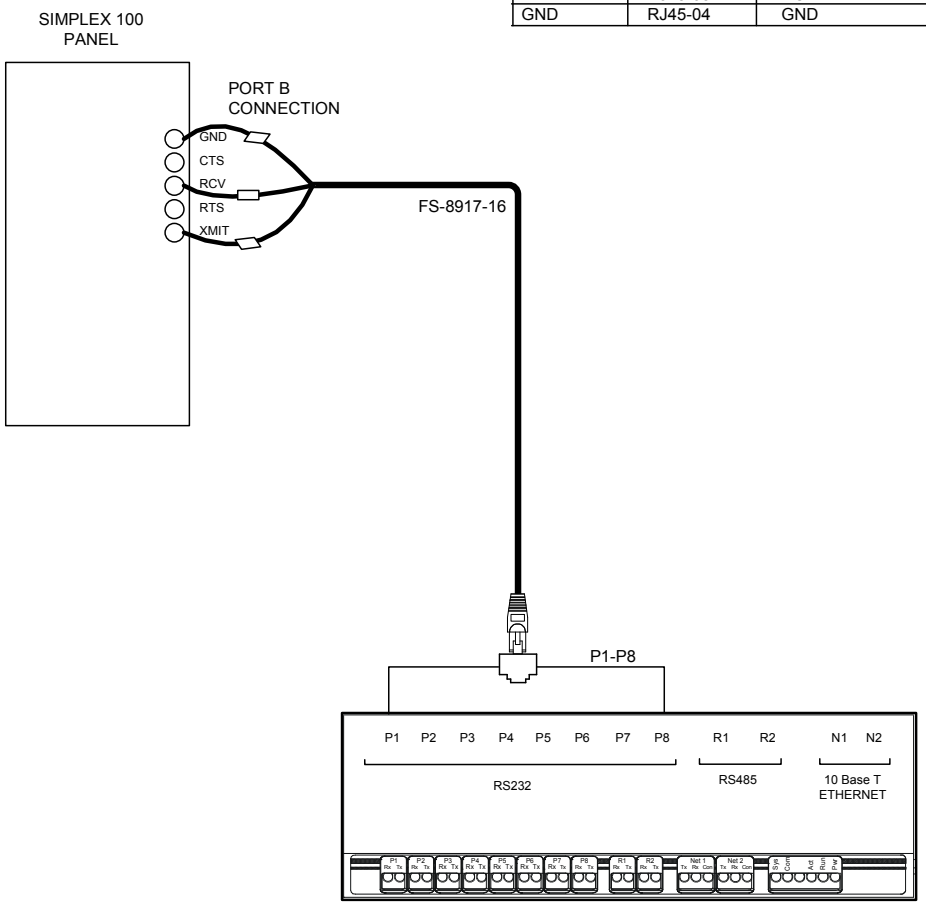




3.2. Connection to a Simplex 4100 Panel

WIRE LIST

FS-X40 FUNCTION	FROM	SIMPLEX 4100 PANEL
RX	RJ45-01	XMIT
TX	RJ45-08	RCV
GND	RJ45-04	GND



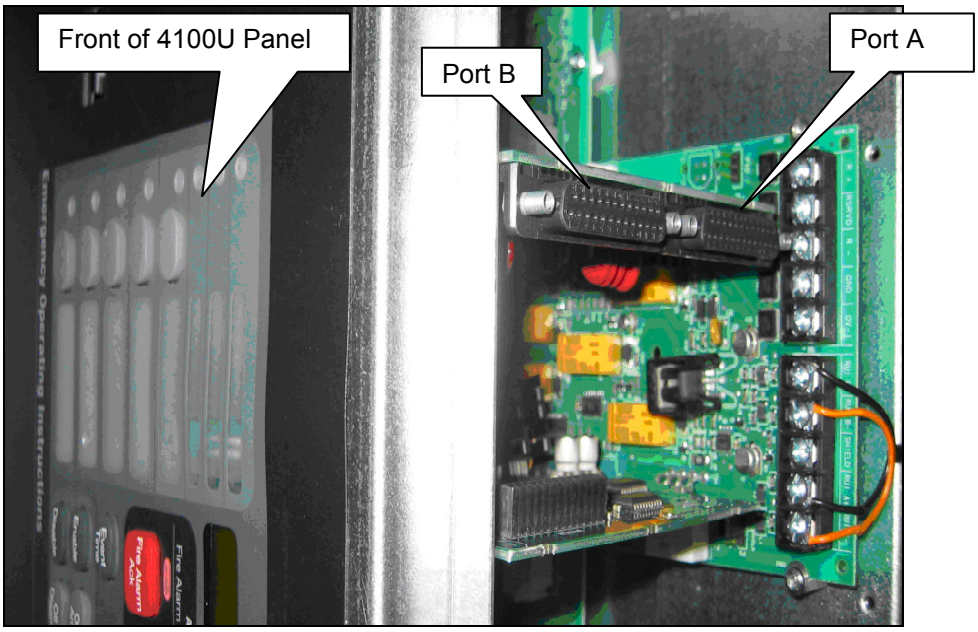
FieldServer Technologies (408)-262-2299

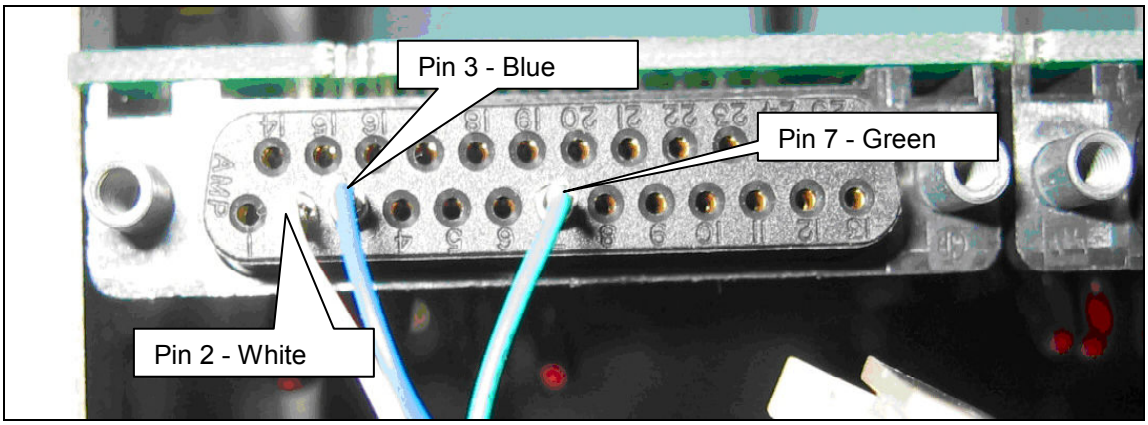
SIMPLEX 4100
CONNECTION DIAGRAM

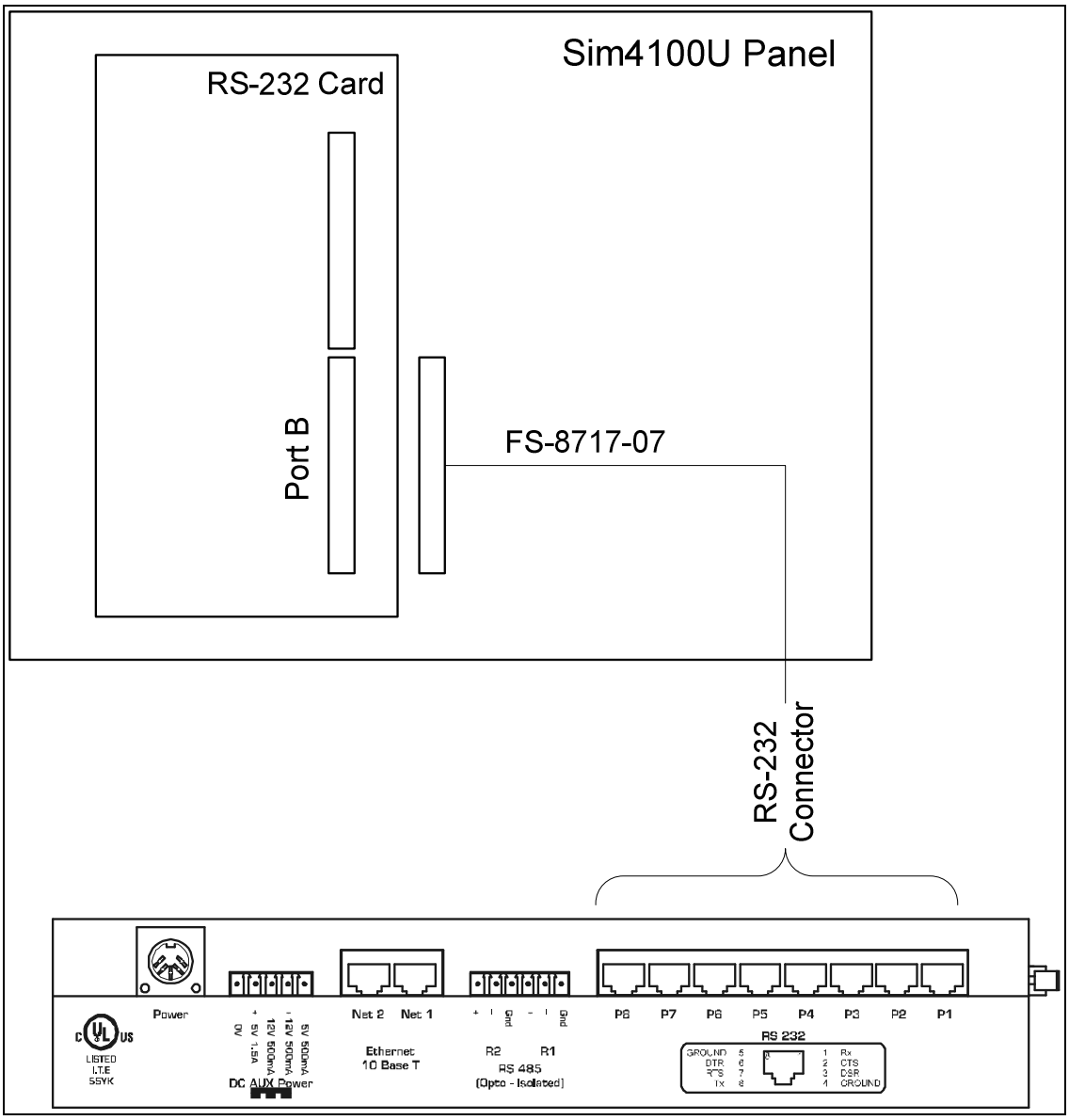
BASE NAME:
FILE NAME: FS-T28700-41 .VSD

DATE: 09/26/07
BY: MN

3.3. Connection to a Simplex 4100U Panel






Sim4100U Panel
RS-232 Card
Port B
FS-8717-07
RS-232
Connector
Power
Net 2
Net 1
P8
P7
P6
P5
P4
P3
P2
P1
RS 232
Ethernet
10 Base T
R2
R1
RS 485
(Opto - Isolated)
DC AUX Power

4. Configuring the FieldServer as a Simplex Time Recorder Company - 4100 Computer Port Protocol Client

For a detailed discussion on FieldServer configuration, please refer to the relevant instruction manual. The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer (See ".csv" files provided with the FieldServer).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a Simplex Time Recorder Company - 4100 Computer Port Protocol Server.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for Simplex Time Recorder Company - 4100 Computer Port Protocol communications, the driver independent FieldServer buffers need to be declared in the "Data Arrays" section, the destination device addresses need to be declared in the "Client Side Nodes" section, and the data required from the servers needs to be mapped in the "Client Side Map Descriptors" section. Details on how to do this can be found below.

Note that in the tables, * indicates an optional parameter, with the bold legal value being the default.

4.1. Data Arrays

Section Title
Data_Arrays

Column Title	Function	Legal Values
Data_Array_Name	Provide name for Data Array	Up to 15 alphanumeric characters
Data_Format	Provide data format. Each Data Array can only take on one format.	FLOAT, BIT, Uint16, Sint16, Packed_Bit, Byte, Packed_Byte, Swapped_Byte
Data_Array_Length	Number of Data Objects. Must be larger than the required data storage area.	1-65535

Example

```
//  Data Arrays

Data_Arrays
Data_Array_Name,    Data_Format,    Data_Array_Length
DA_AI_01,           UInt16,         200
DA_AO_01,           UInt16,         200
DA_DI_01,           Bit,            200
DA_DO_01,           Bit,            200
```

4.2. Client Side Connection Descriptions

Section Title
Connections

Column Title	Function	Legal Values
Port	Specify which port the device is connected to the FieldServer	P1-P8, R1-R2[3]
Baud*	Specify baud rate	110 – 115200, standard baud rates only.
Parity*	Specify parity	Even, Odd, None, Mark, Space
Data_Bits*	Specify data bits	7, **8**
Stop_Bits*	Specify stop bits	1
Protocol	Specify protocol used	sim4100
Handshaking*	Specify hardware handshaking	RTS, RTS/CTS, None
Poll Delay*	Time between internal polls	0-32000 seconds, **1 second**

Example

```
// Client Side Connections

Connections
Port,       Protocol,   Baud,   Parity,   Handshaking,   Poll_Delay
P8,         Sim4100,    9600,   Even,     None,          0.100s
```

4.3. Client Side Node Descriptors

Section Title
Nodes

Column Title	Function	Legal Values
Node_Name	Provide name for node	Up to 32 alphanumeric characters
Node_ID	Ad	This parameter is IGNORED. Special keywords to define the card-sub-point are described in section 4.4
Protocol	Specify protocol used	Sim4100
Port	Specify which port the device is connected to the FieldServer	P1-P8, R1-R2[3]
PLC_Type*	Required for Simplex4100 Panels. If not specified then a Simplex 4100/4020 panel is assumed. 4020/4100 - panels with firmware version 9x or earlier. 4100U – panels with firmware version 10x or later.	**4100**, 4020, 4100U

[3] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.

Example

```
//  Client Side Nodes

Nodes
Node_Name,      PLC_Type,   Protocol,   Connection
Device1,        4100U,      Sim4100,    P8
```

4.4. Client Side Driver Tables

A driver table is used to extend a table of values/attributes that have been hard coded into the driver. It is possible to extend the tables using CSV file parameters.

Additional information on the use of these tables may be found in Appendix A.8

4.4.1. SHOW Response Attributes Driver Table

Column Title	Function	Legal Values
Protocol	The protocol must be specified on each row of a driver table.	Sim4100
sim4100_Attr_Name	The SHOW command response consists of a number of attributes and their current state/ values. Use this parameter to add a new attribute to the table.	The exact character sequence that must be specified. May include an equal sign.
sim4100_Attr_Offset	If the response contains the attribute defined above, its current state/value must be stored at offset x in the associated Data Array. Use this parameter to define x. Take care to leave enough space for those attributes which have multiple values.	May not be zero.
sim4100_Attr_Method	This parameter tells the driver how to convert the current state/value for storage in the Data Array. For example, the driver cannot store the state 'Normal' . By specifying method 1, you tell the driver to use the state descriptor 'Normal' in a lookup table of attribute states to find the value associated to Normal and to store that value.	1,2,3 May not be zero.

4.4.2. SHOW Response Attribute States Driver Table

Column Title	Function	Legal Values
Protocol	The protocol must be specified on each row of a driver table.	Sim4100
sim4100_Attr_State_Name	Use this parameter to extend this list of predefined attribute states.	Define a state word such as 'Normal' and associate a value using the 'value' parameter.
sim4100_Attr_State_Value	This parameter is the value to be associated with the 'name'	May not be zero.

4.5. Client Side Map Descriptors

4.5.1. FieldServer Specific Map Descriptor Parameters

Column Title	Function	Legal Values
Map_Descriptor_Name	Name of this Map Descriptor	Up to 32 alphanumeric characters
Data_Array_Name	Name of Data Array where data is to be stored in the FieldServer	One of the Data Array names from "Data Array" section above
Data_Array_Location	Starting location in Data Array	0 to maximum specified in "Data Array" section above
Function	Function of Client Map Descriptor	RDBC, WRBC, WRBX

4.5.2. Driver Specific Map Descriptor Parameters

Column Title	Function	Legal Values
Node_Name	Name of Node to fetch data from	One of the node names specified in "Client Node Descriptor" above
Length	Length of Map Descriptor - must always be specified. If the length of the response (such as errors / earths, show, revision) is not known in advance it should be set to a value large enough to store to allow some contingency. If data cannot be stored because an array is too short the driver will produce a message in the error log.	
Address	Not required. The address is specified by using the card-point-sub specification described in section 4.4.2	

4.5.3. Timing Parameters

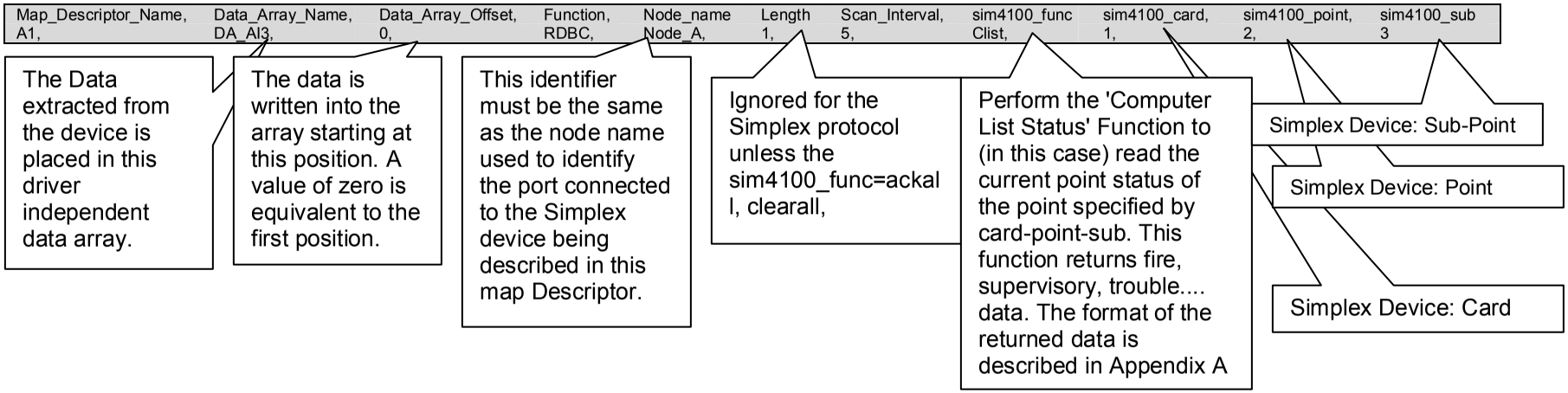
Column Title	Function	Legal Values
Scan_Interval	Rate at which data is polled	>0.1s

4.5.4. Protocol (Simplex Device) Specific Parameters

Column Title	Function	Legal Values
sim4100_func	A keyword which controls the function being performed or the type of data being polled / written.	Further notes on these keywords are provided in Appendix A Ackall, Setd, Disable, Restart, Clistall, Clist, Time, Ctime, Ack, Xpoint, Seta, Super, Show, Earths, Value, ClearAll
The *Simplex Time Recorder Company - 4100 Computer Port Protocol* only uses the standard 4100 address format of <Card>-<Point>-<Sub-point>. Symbolic addressing is not supported. The following keywords are used to address devices.		
sim4100_Card	Simplex Address <Card>	Further notes and examples are provided in Appendix A
sim4100_Point	Simplex Address <Point>	
sim4100_Sub	Simplex Address <Sub_Type>	
sim4100_WriteThru*	Only appropriate when the sim4100_func=clist. Controls the write through behavior of the clist function. See Appendix A.20 for additional information. When using the default value then the write commands are done using the format SET c-p-s ON/OFF. If the parameter is set to value then writes are done using the format SET c-p-s value.	Onoff, value
Store_Unsolicited*	Control the ability of 'CLIST' map descriptors to be used to store data from unsolicited messages. Refer also to Appendix A.20	Yes/No

4.5.5. Map Descriptor Example 1. - Read Point Status

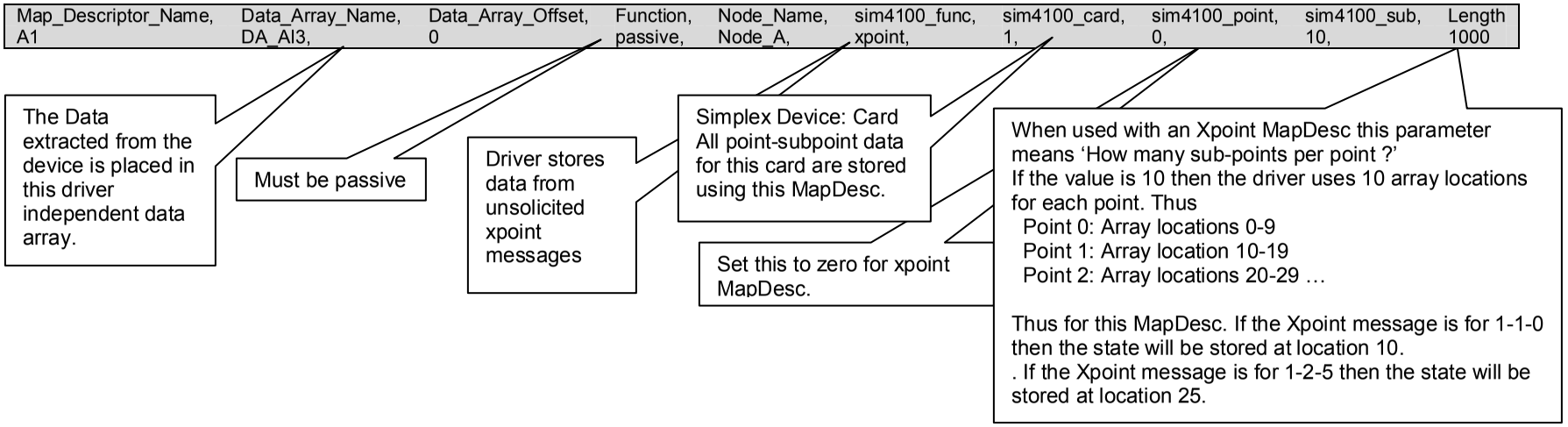
This Map Descriptor can be used to poll for the status of a particular point. When the response is obtained the driver sets the value of one Data Array element to a number indicating the point's status. The values are described in Appendix A.4. You need one such Map Descriptor for every point whose status you wish to poll. Notes in Appendix A.13 provide more information



4.5.6. Map Descriptor Example 2. - Use unsolicited messages from the Panel to determine point status

This Map Descriptor can be used to store point status data when the FieldServer receives an unsolicited message from the Panel containing point status information (Xpoint messages). The panel sends an Xpoint message each time a point's status changes to any non-normal state. Using these Map Descriptors will ensure that the FieldServer is constantly updated with the latest panel status information. The Map Descriptor's are passive so they can be used in a joint strategy with the clist function (section 4.4.1) to keep track of a point's status. Notes in Appendix A provide more information

One Xpoint Map Descriptor is required for storage of Xpoint messages from each card. For a given card, the driver uses a mapping function based on the point-subpoint address to determine the array location to store the state for the c-p-s.



5. Configuring the FieldServer as a Simplex Time Recorder Company - 4100 Computer Port Protocol Server

The driver contains some server side functionality which has been developed to meet FieldServer's continuous quality assurance efforts. However, the server side functions are not documented or supported for customer use. If you have a strong requirement for this functionality then please contact the Sales and Marketing group of FieldServer.

Appendix A. Advanced Topics

Appendix A.1. Hardware Handshaking

The driver does not support the Simplex RTS/CTS handshaking model. Therefore deselect the HSHAKE terminal flag or connect CTS to RTS with a jumper on the 4100 side.

Appendix A.2. Simplex Address Formatting – Specific Keywords

The Simplex Time Recorder Company - 4100 Computer Port Protocol only uses the standard 4100 address format of <Card>-<Point>-<Sub-point>. Symbolic addressing is not supported. The following table lists keywords which control the behavior of the FieldServer with respect to connection to a Simplex device and the permissible values determining the type of data being read/written.

<table>
<tr><th>Keyword</th><th>Description</th><th>Function</th></tr>
<tr><td>Ackall</td><td>This command acknowledges all card-point-sub states based on the values found in the associated arrays.
The FieldServer watches the Data Array to see if we need to send an ack.
<table>
<tr><th>DA element</th><th>Accepted</th></tr>
<tr><td>1st – ack all</td><td></td></tr>
<tr><td>2nd - ack A</td><td>primary abnormal state</td></tr>
<tr><td>3rd – ack F</td><td>Fire alarm</td></tr>
<tr><td>4th – ack P</td><td>Priority 2</td></tr>
<tr><td>5th – ack S</td><td>Supervisory</td></tr>
<tr><td>6th – ack T</td><td>Trouble</td></tr>
<tr><td>7th – ack C</td><td>Control</td></tr>
</table>
Set the array element to 1 to initiate the command. The FieldServer clears the value on completion.</td><td>WRBC
Do not specify c-p-s in the Map Descriptor.</td></tr>
<tr><td>Ack</td><td>This command allows the user to acknowledge a single point. The specified Data Array is inspected and the value of the single element is used to determine which device state's are ack'd. Refer to Appendix A.4</td><td>WRBC
Specify c-p-s in the Map Descriptor.</td></tr>
<tr><td>Clist</td><td>This command returns the current point status for one point. Refer to Appendix A.4 and Appendix A.20</td><td>RDBC
Specify c-p-s in the Map Descriptor.</td></tr>
<tr><td>Earths[4]</td><td>This function obtains earth/ground status information from the panel. Two Data Array elements are used to store the normal (=1) or abnormal (=2) for each card. The first element is for the positive ground and the second element is the negative ground. Where cards do not report both, the first element of the pair is used.
The array position is obtained by multiplying the card number by two and adding the offset specified in the Map Descriptor. Set the length of this Map Descriptor to twice the value of the maximum card number.</td><td>RDBC
Do not specify c-p-s in the Map Descriptor.</td></tr>
</table>

[4] This driver function used the Simplex 'CSHOW c-p-s CVAL' command. It is only supported by panels with firmware revision numbers greater than 10

Keyword	Description	Function
Value	Stores analog value(s) read from a particular devicewithout scaling or units. When more than one value is reported the driver stores the values in consecutive array elements. Ensure that the Map Descriptor's usage of the Data Arrays is spaced appropriately.	RDBC Specify c-p-s in the Map Descriptor.
Show	Each type of Simplex device reports a different set of attributes and attribute states/values. Refer to Appendix A.8 for more information. The driver analyses the response from the poll. When an attribute is recognized, the attribute state is evaluated. If this is recognized then the driver stores a value, corresponding to the attribute state, at an array location corresponding to the attribute. 4.4 provides additional information. The driver can only recognize attributes and attribute states that it is programmed to recognize. Using the information provided in Appendix A.8, set the length of the Map Descriptor equal to array position of highest attribute. Ensure that Map Descriptors using this function do not use overlapping areas of the Data Arrays. See example in Appendix A.19.	RDBC Specify c-p-s in the Map Descriptor.
Setd	This command allows the user to manipulate the status and/or priority of a control point The port access level must be set appropriately in the Simplex device otherwise the device returns an error.	WRBC Specify c-p-s in the Map Descriptor.
Seta	This command allows the user to: • Manipulate the status and/or priority of a control point • Modify the value of an analog pseudo point. • Set the sensitivity of a TrueAlarm sensor • Set the rate-of-rise threshold of a TrueAlarm heat sensor • Select the audio channel of a speaker circuit	WRBC Specify c-p-s in the Map Descriptor.
Xpoint	Point Status Change. This is an unsolicited message sent automatically by a Simplex device to report a change in point status. The card-point-sub is used to calculate an offset into the associated Data Array. Read Appendix A.4 to understand this better. The state being reported determines the value being written into the Data Array. Read Appendix A.5 to understand this better.	Passive Specify c-p-s in the Map Descriptor.
Disable	Not Implemented	
Restart	Not Implemented	
Time	This command sets and displays the time and date in "user" format. As a command it sets the hour minute second of the Simplex device by getting the values from the Data Array associated with the Map Descriptor. The first element contains the hour, the second the minute and the third contains the second. A 24 hour clock is assumed. As a query, the data is unpacked into the Data Array in the same format as described above.	RDBC (Query) or WRBC (Set) Do not specify c-p-s in the Map Descriptor.

Keyword	Description	Function
Ctime	As a command it sets the hour minute second of the Simplex device by getting the values from the Data Array associated with the Map Descriptor. The first element contains the hour, the second the minute, the third element contains the second, the 4th contains the day of the week, the 5th contains the month, the 6th contains the day of the month and the 7th element of the array contains the year (value 01 indicates 2001). A 24 hour clock is assumed. As a query, the data is unpacked into the Data Array in the same format as described above.	RDBC (Query) or WRBC (Set) Do not specify c-p-s in the Map Descriptor.
Silence	Used to send a silence signal to the Simplex device. This is a triggered command. When the element in the Data Array associated with the Map Descriptor is set to 1 then the command is sent to the Simplex device. The driver will set the value to zero when the command has been acknowledged.	WRBC Do not specify c-p-s in the Map Descriptor.
Reset	Used to send a reset signal to the Simplex device. This is a triggered command. When the element in the Data Array associated with the Map Descriptor is set to 1 then the command is sent to the Simplex device. The driver will set the value to zero when the command has been acknowledged.	WRBC Do not specify c-p-s in the Map Descriptor.
Revision	Used to request revision information from the Simplex panel. Use of this Map Descriptor is recommended as it allows the driver to generate a warning if an unknown Simplex revision is encountered. Make sure that the length of the Map Descriptor is sufficient to store all the revision information. A Length of 200 is recommended.	RDBC Do not specify c-p-s in the Map Descriptor.
Errors	Use this keyword to define a Map Descriptor which tells the driver where to store error messages received from the Simplex device. The most recent message is stored in the Data Array specified. Make sure that the Data Array length is long enough to store enough meaningful information. A length of 200 is recommended.	Passive Do not specify c-p-s in the Map Descriptor. If using RUINET to monitor the FieldServer, display the Data Array associated with this Map Descriptor in 'String' format so that you can read the error message easily. The driver appends information about the Map Descriptor which generated the error to make the error more easily understandable.

Keyword	Description	Function
ClearAll	Map Descriptor's which use this function do two things; Firstly, they register a c-p-s with the driver. Secondly they define a Data Array name and element range that must be set to zero when the ClearAll function is activated. Up to 4 c-p-s's may be registered per FieldServer. These registered points are monitored each time a Clist response is obtained as well as each time the panel sends an unsolicited Xpoint message with a state change. If one of these messages reports a 'U1' state for a registered point then the driver processes all 'ClearAll' Map Descriptor's and sets all the associated array values to zero. An example of the use of ClearAll is provided in section 6.12 example 9.	Passive Specify c-p-s in the Map Descriptor (but read the notes on the left)
Warm_Start	Generates a warm restart message. Used to test the driver.	Used for simulation only.
Cold_Start	Generates a cold restart message. Used to test the driver.	Used for simulation only.

Appendix A.2.1. Sim4100_Card Keyword

The FieldServer will accept any positive integer number including zero; however, not all values are valid for Simplex devices. Refer to Note (1).

Many commands and output message contain system point ID fields. These fields reflect the way a 4100 point (local, external, real, pseudo), is referred to.

There are two basic formats allowed, address format <apoint>, and symbolic format <spoint>.

In the Simplex device the terminal ADDRESS flag is set (DEFAULT) so that <apoint> is always used in computer messages; otherwise, the symbolic form is used. The FieldServer cannot work with symbolic (spoint) addresses.

Appendix A.2.2. <apoint>

Format <card>-<point>-<sub>	
Legend:	
<card>	4100 card, pseudos included, See note (1)
<point>	4100 point (sometimes slot), See note (2)
<sub>	4100 sub-point (sometime point), See note (2)
Examples:	
0-6-6	Master trouble point (LCD trouble)
5-0-1	Typical card status point, card at address 5
3-1-0	Point 1 for card at address 3

Notes:
(1) The following ranges are valid for Simplex Devices:

Card address	Card type
0-119	Physical (Hardware) cards
128-143	Digital Pseudo cards
144-159	Analog Pseudo cards
160-175	List Pseudo cards

(2) The range of point and sub-point fields for point addressing is very sparse and depends on the type of card at that location. Contact Simplex Time Company for details on point address ranges for specific cards.

Appendix A.2.3. Sim4100_Point Keyword

The FieldServer will accept any positive integer number including zero; however, not all the values are valid for Simplex devices - see Sections 6.3 and 6.4 for further information.

Appendix A.2.4. Sim4100_sub Keyword

The FieldServer will accept any positive integer number including zero; however, not all the values are valid for Simplex devices - see Sections 6.3 and 6.4 for further information.

Appendix A.3. How to use Data Arrays to map to/from Card-Point-Sub addresses

Some commands derive a card-point-sub address by inspecting a FieldServer Data Array. Others receive data from a device with a card-point-sub address and modify the data in an array based on the card-point-sub address. This section explains how to make the connection between an index into a Data Array and a card-point-sub address.

In a simple world the Data Array index would be

Index = card * max point per card * max sub point per point + point * max sub point per point + sub
Where max point per card and max sub point per point could be large numbers.

As you can imagine this would require huge sparse Data Arrays. To reduce the Data Array size the FieldServer uses a mapping algorithm which can be optimized based on the addresses of the Simplex devices. The map is manipulated by using the sim4100_card/point/sub parameter values.

Example:

Consider the following Map Descriptor fragment.

… ,	sim4100_func,	sim4100_card,	sim4100_point,	sim4100_sub,	data_array_offset
	Xpoint,	**10**,	5,	10,	0

If data is received for point <c>-<p>-<s> = **9**-0-0
This data will NOT be processed because the card number does not match the value of the sim4100-card

If data is received for point <c>-<p>-<s> = **10**-20-0, however, the data will be processed.
The array location is derived using the following formula (sim4100_sub is to be read as the "number of sub-points per point"; sim4100_card's value will be ignored.)

Location = data_array_offset + <p> * sim4100_sub + <s>
= 0 + 20 * 10 + 0 = 200

Appendix A.4. Simplex Point Status Data Format

When a point status is obtained the FieldServer will write one byte of data to a Data Array. The byte will contain the following information. Because each point can report a number it only makes sense to use Data Arrays that are not bit arrays.

Bit	Identifier	Description
0 (First Bit)	F	Fire Alarm
1	P	Priority 2
2	S	Supervisory
3	T	Trouble
4	U	Utility
5	C	Control
6	D	Disable
7	A	Primary state (based on point type - F if smoke detector, C if signal circuit, etc.)

Appendix A.5. Simulation of the Xpoint command

The following notes apply only to FieldServer Technologies engineers.
The sim4100_func=xpoint keyword is used to parse unsolicited point status change messages sent by Simplex devices. For simulation purposes it a wrbc version of this function has been implemented to test the response parsing ability of the slave portion of the driver.

Appendix A.6. Application Supervision Messages

Section 7.2 of the Simplex 4100 protocol describes unsolicited messages from a Simplex device. This sim4100_func=super wrbc command is used to test the driver's ability to parse these messages.
The 4100 protocol supports a periodic application supervision message. This supervision poll is performed if the TERMINAL flag POLL is set (COMPUTER DEFAULT). The objective of the supervision poll is two-fold:

- It is the only periodic message that can be expected to be sent by the 4100, thus establishing the basis for supervising the line.
- To ensure that all layers of the two systems are operating properly and able to respond to messages. For example, in a PC implementation that uses a Terminate-and-Stay-Resident (TSR) device driver to implement the protocol, the answer to the supervision poll should be done in a way such that if the program exits to DOS, the TSR will not continue to indicate to the 4100 that everything is OK, when in fact, the PC will not be able to annunciate an alarm.

Appendix A.7. Driver Stats

Appendix A.7.1. How the Driver counts bytes and messages received and transmitted.

"Ack" messages sent/received by the driver in response to read/write messages are NOT counted as messages. However, the single byte produced by these messages is included in the byte count.

The driver does not count DLL layer messages as messages.

The driver counts bytes at the DLL layer. The byte count includes the bytes that wrap application layer messages, acks and the port supervision and responses messages.
The driver counts messages at the application layer.. This means that if you use RUINET to monitor the FieldServer and you view the Map Descriptor’s the byte count stats will always be zero.

Some Map Descriptors require data in the Data Arrays to trigger a write command. An example is the "Ack" command. The driver does not count one of these messages as being sent until the array actually triggers a poll to be sent.

Appendix A.7.2. Driver Exposed Stats

The driver is capable of exposing statistics about its behavior in a Data Array. It is necessary to create a Data Array with name sim4100-stats as per the example below and it will be updated by the driver. Note that the stat number corresponds to the offset.

Take care not to poke any values into the 1st 10 elements of this Data Array (offsets 0 to 9). Doing so will trigger internal diagnostics and may interfere with normal operation.

A different set of stats is maintained for each connection. Each connection uses 100 elements of the data array. Ensure the array length is large enough if the port number is large.

```
Data_Arrays
Data_Array_Name,        Data_Format,        Data_Array_Length
sim4100-stats    ,      UINT16       ,      1000
```

At revision 1.07a of the driver and before, no stats had been exposed.

Stat number	Stats	Description
10	SIM4100_STAT_XPOINT_CARD	The Card in c-p-s from most recent xpoint store
11	SIM4100_STAT_XPOINT_POINT	The Point in c-p-s from most recent xpoint store
12	SIM4100_STAT_XPOINT_SUB	The SubPoint in c-p-s from most recent xpoint store
13	SIM4100_STAT_XPOINT_QUALIFIER	The Qualifier from most recent xpoint store
14	SIM4100_STAT_XPOINT_QUALIFIER_AS_ENUM	The Qualifier from most recent xpoint store, stored as an enumeration – See Note1 for bit states
15	SIM4100_STAT_XPOINT_STATE	The reported state from most recent xpoint store. State value: 0 FALSE/Normal 1 TRUE/Abnormal
16	SIM4100_STAT_XPOINT_ACK_STATE	The reported ack state from most recent xpoint store. Ack state: *=needs ack, -=acked (always "-" for U or C states)
17	SIM4100_STAT_XPOINT_HOUR	The Time from most recent xpoint store
18	SIM4100_STAT_XPOINT_MIN	The Time from most recent xpoint store
19	SIM4100_STAT_XPOINT_SEC	The Time from most recent xpoint store
20	SIM4100_STAT_XPOINT_DOW	The Date from most recent xpoint store
21	SIM4100_STAT_XPOINT_DAY	The Date from most recent xpoint store
22	SIM4100_STAT_XPOINT_MONTH	The Date from most recent xpoint store

Stat number	Stats	Description
23	SIM4100_STAT_XPOINT_YEAR	The Date from most recent xpoint store
24	SIM4100_STAT_XPOINT_COMBO_STATE_OLD	A single point could potentially be active in more than one state simultaneously. The driver tracks the combine state by building a UINT whose bits indicate the state. This is the combo state before the update. See Note 1 for bit states.
25	SIM4100_STAT_XPOINT_COMBO_STATE_NEW	A single point could potentially be active in more than one state simultaneously. The driver tracks the combine state by building a UINT whose bits indicate the state. This is the combo state after the update. See Note 1 for bit states.

Note 1 – Bit States.

Qualifier:
Enum=0 Qual=F Fire alarm state
Enum=1 Qual=P Priority 2 alarm state
Enum=2 Qual=T Trouble state
Enum=3 Qual=S Supervisory state
Enum=4 Qual=U Utility monitor, digital/analog pseudo state
Enum=5 Qual=C Control state (non pseudo)
Enum=6 Qual=D Disable Trouble state

Appendix A.8. SHOW Function Attributes and Attribute States

The Show command provides an ASCII response formatted for printing. The driver parses these messages and converts the data to numbers which can be sent to upstream devices using another protocol.

The driver performs the following tasks in analyzing the response.

- On a line by line basis from the left, it searches for an attribute against a table of attribute strings. If an attribute string is found in the line then processing continues. Otherwise the line is discarded.
- The attribute number is recorded. It will be used to determine the array location where the attribute state/value will be stored.
- The attribute also determines the state/value extraction method and attempts to determine the attribute state/value using the appropriate method.
    - Method 1: The driver uses a table of attribute states, comparing them to the remainder of the line. If there is a match the driver stores the value of the attribute state in the array location determined by the attribute,
    - Method 2: The driver looks for (up to three) analog values separated by forward slashes.
    - Method 3: The driver looks for analog values preceded by an equal sign.

- The driver stores in the first array location the number of response lines which resulted in attribute data being stored. This information can be used for trouble shooting.

The following table reports the attributes that the driver recognizes. This list may be extended by changing the configuration. If, for example, the attribute 'ENABLED STATE' is recognized then the state of this attribute will be stored at array location 6.

Attribute	Array Position	Method
Not Defined	0	1
PRIMARY STATUS	1	1
PHYSICAL STATE	2	1
RAW STATE	3	1
ACTIVE STATE	4	1
ARMED STATE	5	1
ENABLED STATE	6	1
UNVERIFIED	7	2
CURRENT DEVICE	8	1
DEVICE	9	1
TEST STATE	10	1
PRESENT SENSITIVITY SELECTED=	11	2
PRESENT SENSITIVITY SELECTED =	11	2
AVERAGE VALUE =	14	3
AVERAGE VALUE=	14	3
AVERAGE =	14	2
AVERAGE=	14	2
AVERAGE	14	2
VALUE =	17	2
VALUE=	17	2
PEAK=	20	2
PEAK =	20	2
TROUBLE THRESHOLD	23	1
OUTPUT STATE	24	1
OUTPUT STATUS	25	1
DETECTOR SOUNDER	26	1
ALARM TEMPERATURE SELECTED=	27	2
DETECTOR RELAY	30	1
TOTAL NUMBER OF TROUBLES	31	2
NODE MISSING	32	1
VERSION CONTROL	33	1
NODE INITIALIZATION IN PROGRESS	34	1
SIMPLEX SERVICE MODE	35	1
EARTH GROUND	36	1
AC POWER	37	1
BATTERY LOW/DISCHARGED	38	1
BATTERY CHARGE	39	1
SYSTEM PSEUDO STATUS	40	1
NETWORK CARD STATUS	41	1
CARD TROUBLE STATUS	42	1
MISCELLANEOUS STATUS	43	1
RELAY STATUS	44	1
PRIORITY	45	2

Attribute	Array Position	Method
CONTROL STATUS	46	1
CURRENT (AMPS)	47	2
CARD MISSING/FAILED	48	1
CORRECT CARD	49	1
RS-232 Interface PORT A	40	1
RS-232 Interface PORT B	41	1
2120/RS-232 PORT Broadcast Fail	42	1
CARD MISSING/FAILED	43	1

The table below reports the attribute states recognized for attribute method=1.

Attribute State	Value	Attribute State	Value
AUTOMATIC CONTROL	1	ARMED	10
OUTPUT NORMAL	2	ENABLED	11
SELF TEST NORMAL	3	ON-LINE	12
CORRECT DEVICE	4	ENABLED	13
PRIORITY 15	5	NORMAL	14
RANGE NORMAL	6	TROUBLE	15
ALARM	7	OFF	16
SHORT	8	ON	17
SHORT	9		0

Examples:

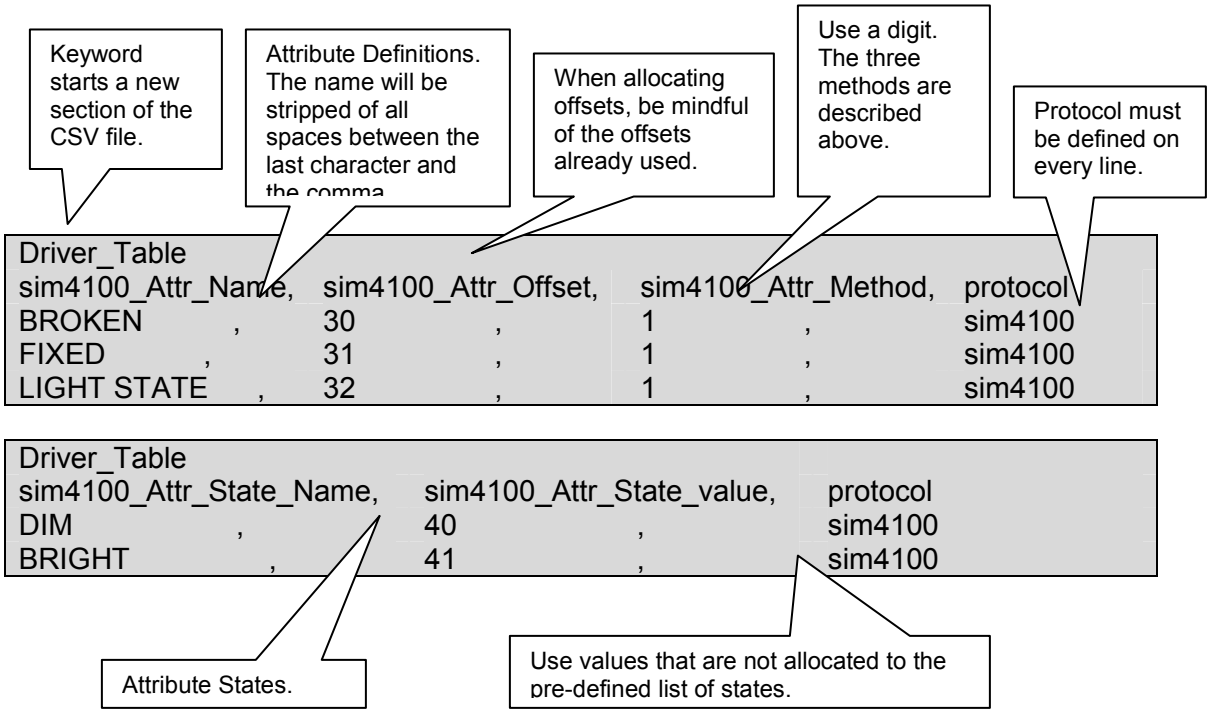
PHYSICAL STATE SHORT
Driver recognizes 'Physical State' as attribute 2 and uses method 1 to evaluate the rest of the line. Driver recognizes 'Short' as attribute state with value 8. Therefore, the driver stores the number 8 at location 2 in the Data Array.

VALUE=77 / 0% OF ALARM / 1.0% SMOKE
Driver recognizes 'VALUE=' as attribute 17 and uses method 2 to evaluate the rest of the line. Driver stores three values; 77, 0 and 1.0 in three consecutive locations starting at location 17. Note that there is a gap between attribute 17 and the next attribute in the table sufficient for storing up to 3 values. Note that a slash separates the three values.

AVERAGE VALUE=75 / ALARM LEVEL=145
Driver recognizes 'AVERAGE VALUE' as attribute 14 and uses method 3 to evaluate the rest of the line. Driver stores two values; 75 and 145 in two consecutive locations starting at location 14. Note that an equal sign '=' precedes each numeric value.

Appendix A.8.1. Extending the List of Show Attributes

You can extend the list of attributes and attribute states that the driver recognizes by modifying the configuration CSV file.
The following example adds three attributes and 4 attribute states. If a device reports an attribute of 'LIGHT STATE' as 'BRIGHT' then the driver will load array element 32 with the value 41.



Appendix A.9. Synchronizing the FieldServer with the Panel

When using the Xpoint function to store point states, each time the panel does a warm-start it sets all point states to normal and then starts evaluating every single one. Thus, after a warm start, the FieldServer will receive Xpoint messages from the panel for every point not in a normal state. This provides one synchronization method. The limitation of this method is that the Simplex panels do not report when a point's state changes back to normal. Thus to maintain the synchronization the upstream device must clear the point to zero once it has read its abnormal state, i.e. The upstream device should consider the data reported by the Xpoint function as latched data.

A second method is to connect/reset the FieldServer when there are no points in an abnormal state.

A third method is poll point states using the Clist function as described in Appendix A.20. This way the FieldServer states will always be updated. Polling is slow and in a system with many points it is possible that it may take several minutes to update status information for all points. Thus combining this method with the use of Xpoint Map Descriptors gives the best of both worlds. When a point changes to 'not' normal, then the FieldServer gets the state change from the Xpoint function immediately and at the same time synchronization is assured by the continuous polling.

A fourth method is provided too. This method allows a range of a data array to be set to zero when a user specified point reports a normal state. Refer to Appendix A.17 for more information.

Appendix A.10. Advanced Map Descriptor Example 1 - Errors

If an error response is received from the panel then if a Map Descriptor similar to this one is defined, the driver will store the error message (and some information about the Map Descriptor that caused the error) in the Data Array DA_ERRORS.

It is best to define the DA_ERRORS array as format BYTE and if you use RUINET to monitor this Data Array change the display format to string so that you can read the error. Refer also to Appendix B.1.

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	sim4100_func,	Length
Error_Mapdesc,	DA_ERRORS,	0,	passive,	Node_A,	Errors,	200

Most recent error returned by the panel is stored here. Subsequent errors overwrite the data in this array.

Must be passive.

Appendix A.11. Advanced Map Descriptor Example 2. - Read Panel Time

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	sim4100_func,	Scan_Interval,	Length
Time_Mapdesc,	DA_TIME,	0,	RDBC,	Node_A,	Time,,	30s,	70

Index 0: Hour (24 hour clock)
Index 1: Minute
Index 2: Second
Index 3: Day of week
Index 4: Day of month
Index 5: Month
Index 6: Year (since 2000)

Appendix A.12. Advanced Map Descriptor Example 3 - Write Panel Time

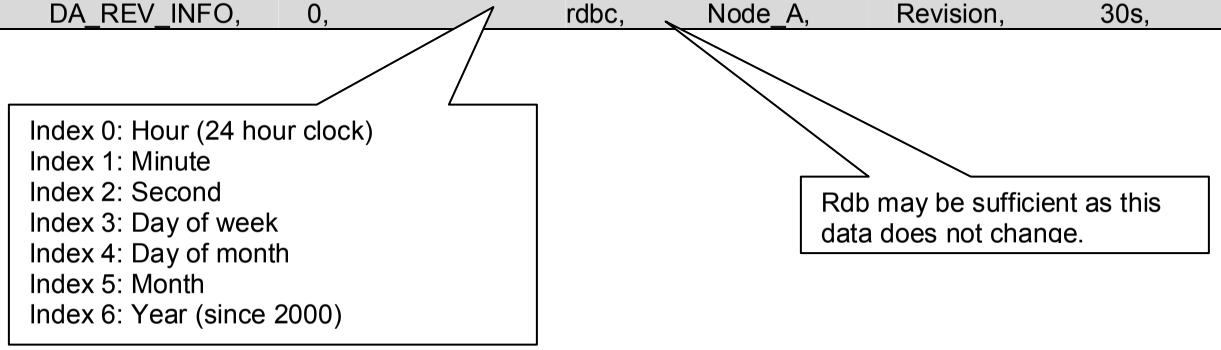
Use Ctime to set the panel time and date and use Time just to set the hour minute and seconds. If the hour is zero then the driver does not send a write message to the panel.

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	sim4100_func,	Scan_Interval,	Length
Time_Mapdesc,	DA_TIME,	0,	wrbc,	Node_A,	CTime,,	30s,	7
Time_Mapdesc,	DA_TIME,	0,	wrbc,	Node_A,	Time,,	30s,	7

Appendix A.13. Advanced Map Descriptor Example 4 - Panel Revision Information

It is best to define tie DA_REV_INFO array as format BYTE and if you use RUINET to monitor this Data Array change the display format to string so that you can read the information

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	sim4100_func,	Scan_Interval,	Length
Error_Mapdesc,	DA_REV_INFO,	0,	rdbc,	Node_A,	Revision,	30s,	200



Appendix A.14. Advanced Map Descriptor Example 5 - AckAll

This example illustrates the use of the 'AckAll' function. Each time the driver uses this Map Descriptor, it checks the data in the Data Array. If one location is non-zero then the appropriate ack message is sent to the panel. As the function is wrbx, the message is only sent when the value is updated.

The 1st element of the Data Array is used to trigger the ack all

2nd – ack	A	Primary Abnormal State
3rd – ack	F	Fire alarm
4th – ack	P	Priority 2
5th – ack	S	Supervisory
6th – ack	T	Trouble

Set the array element to 1 to initiate the command. The FieldServer clears the value on completion

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	sim4100_func,	Scan_Interval,	Length
AckAll_Mapdesc,	DA_ACKALL,	0,	wrbx,	Node_A,	AckAll,	1.0s,	6

Appendix A.15. Advanced Map Descriptor Example 6 - Silence / Reset

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	sim4100_func,	Scan_Interval,	Length
Silence_Mapdesc,	DA_TRIGGERS,	0,	Wrbx,	Node_A,	Silence,	1.0s,	6
Reset_Mapdesc,	DA_TRIGGERS,	1,	Wrbx,	Node_A	Reset,	1.0s	6

As the function is wrbx, the message is only sent when the value is updated.

If location 0 goes non-zero then a silence message is sent. If location 1 goes non-zero then a reset message is set.
Driver's set the trigger back to zero once the message has been set.

Note: When configured as a Server, the driver increments the value in the associated DA element each time a silence/reset is received.

Appendix A.16. Advanced Map Descriptor Example 7 - Acknowledge a specific point

The ackall function can be used to ack all points or all points that are in a particular state. What about if you wish to send an ack message for a single point. One Map Descriptor is required for each c-p-s combination you require specific acknowledgements for. The driver checks the array location corresponding to the Map Descriptor. If the value is non-zero then an ack message is sent. The value is used to determine what kind of ack is sent. As the function is wrbx, the message is only sent when the value is updated.

Bit 0:	F	- Fire Alarm Panel
Bit 1:	P	- Priority 2 alarm state
Bit 2:	T	- Trouble State
Bit 3:	S	- Supervisory State
Bit 4:	U	- Utility Monitor
Bit 5:	C	- Control State
Bit 6:	D	- Disable Trouble State
Bit 7:	A	- Primary Point

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	Length,	Scan_Interval	sim4100_Func	Sim4100_Card,	Sim4100_Point,	Sim4100_Sub	Length
Ack_mapdesc1,	DA_ACK,	0,	Wrbx,	Node_A,	1,	1.0s,	Ack,	1,	2,	3,	1
Ack_Mapdesc2,	DA_ACK,	1,	wrbx,	Node_A,	1,	1.0s,	Ack,	1,	2,	4,	1

Appendix A.17. Advanced Map Descriptor Example 8 - ClearAll

As the Xpoint messages (unsolicited message from the panel reporting c-p-s status changes) only report when a c-p-s goes to a non-normal state you may require a way of synchronizing the FieldServer data to the Panel when everything is normal. This function is provided as an aid. Typically it is used in conjunction with a pseudo-point programmed into your panel.
The idea behind this function assumes that there is some point(s) which when they report a state of U1 trigger the driver to clear sections of one or more Data Arrays.

When you create Map Descriptor's with the ClearAll function the driver makes a note of the c-p-s. If an Xpoint message is received from the Panel for the specified c-p-s or you use clist to poll for the state of the c-p-s and the state is U1 then this triggers this ClearAll action. When the action is triggered the driver sets all array point covered by all Map Descriptor's with the clearall function to zero, without consideration of the c-p-s associated with the Map Descriptor.

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	sim4100_func,	sim4100_card,	sim4100_point,	sim4100_Sub,	Length
Clear_Mapdesc1,	DA_AI,	0,	passive,	Node_A,	ClearAll,	1,	2,	3,	100
Clear_Mapdesc1,	DA_2,	50,	passive,	Node_A,	ClearAll,	1,	2,	3,	50

Two different arrays, starting at two different locations and with two different lengths will get set to zero when c-p-s=1-2-3 goes to state U1.

An xpoint mapdesc must be created for any clear all c-p-s. The clear all logic never gets called until an xpoint store is done for the c-p-s configured to do clearall.

The sim400_func must be ClearAll.

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	sim4100_func,	sim4100_card,	sim4100_point,	sim4100_Sub,	Length
Clear_Mapdesc1,	DA_I,	0,	passive,	Node_A,	Ack,	1,	2,	3,	100
Clear_Mapdesc1,	DA_2,	0,	passive,	Node_A,	Ack,	1,	2,	3,	100

Two different arrays, starting at two different locations and with two different lengths will get set to zero when c-p-s=1-2-3 goes to state U1.

If 1-2-3 or 1-2-4 go to state U1 then the dara array regions associated with both MapDesc's' are set to zero.

Appendix A.18. Advanced Map Descriptor Example 9 - Earths

You can only use this function if the panel firmware version is greater than or equal to revision 10.0. This function uses reads earth / ground status information from the panel.

If, for example, card 3 reports information then the driver uses array elements 6 & 7 to store information for this card. Obtain the array location by multiplying the card number by two.

If the card reports positive and negative earth data then the driver stores the positive earth data at location 6 and the negative earth data at location 7.

If the card reports earth / ground state information without the keywords ‘Positive’ or ‘Negative’ the driver stores the data at location 6.

The driver stores a value of 1 to report normal and a value of 2 to report abnormal.

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	Length,	Scan_Interval	sim4100_Func	Sim4100_Card
Earth_mapdesc1,	DA_EARTHS,	0,	rdbc,	Node_A,	20,	1.0s,	Earths,	1

Appendix A.19. Advanced Map Descriptor Example 10 - Show

One Map Descriptor is required for each point whose attributes you wish to 'show'. The show function reads data that describes the attributes and the state of each attribute for a single device. Every type of device has a different set of attributes. When the response is received by the driver, it fills a number of Data Array locations with numeric values that represent the attributes and their states. You should reserve at least 100 array locations for each Map Descriptor by setting the length to 100.

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_Name,	Length,	Scan_Interval	sim4100_Func	Sim4100_Card,	Sim4100_Point,	Sim4100_Sub
Show_mapdesc1,	DA_SHOW,	0,	rdbc,	Node_A,	100,	1.0s,	Show,	1,	2,	3

By way of example assume that point 1-2-3 is a Heat Detector and the response to the show query is as follows

```
40 Character Custom Label
Mx-y-2                          HEAT DETECTOR
DEVICE ADDRESS: 7-10-2            TYPE: COMBO
IDNET INTERFACE CARD
LOCAL UNIT - MAIN PANEL
UNIT NUMBER: 0  RUI NUMBER: LOCAL
---------------------------------------
PRIMARY STATUS                        NORMAL
CURRENT DEVICE                CORRECT DEVICE
DEVICE                              ON_LINE
TEST STATE                  SELF TEST NORMAL
ALARM TEMPERATURE SELECTED= 135 DEG F
VALUE=0 / -41 DEG F
PEAK=0 / -41 DEG F
TROUBLE THRESHOLD              RANGE NORMAL
ENABLED STATE                       ENABLED
UNVERIFIED                                  0
```

The driver will load the array DA_SHOW starting at offset zero for up to 100 elements. Using the following tables we determine what values you can expect for this response.

Array Position	Attribute	Value	Filled In[5]	Note
0	Not Defined	10	1	!
1	PRIMARY STATUS	14 (Normal)	1	#
2	PHYSICAL STATE			~
3	RAW STATE			
4	ACTIVE STATE			
5	ARMED STATE			
6	ENABLED STATE	11 (Enabled)	1	
7	UNVERIFIED	0	1	
8	CURRENT DEVICE	4 (Correct Device)	1	
9	DEVICE	12 (On_Line)	1	
10	TEST STATE	3 (Self test normal)	1	
11	PRESENT SENSITIVITY SELECTED			
14	AVERAGE			
17	VALUE	0	1	
18		-41	1	
19				*
20	PEAK	0	1	
21		-41	1	
22				*
23	TROUBLE THRESHOLD	6 (Range Normal)	1	
24	OUTPUT STATE			
25	OUTPUT STATUS			
26	DETECTOR SOUNDER			
27	ALARM TEMPERATURE SELECTED=	135	1	
30	DETECTOR RELAY			

Notes:

! The value 10 represents the count of the number of attributes that were extracted from the response. It is not equal to the number of array locations filled in because some attributes (e.g. Value) result in more than one array location being updated.

~ The un-filled-in locations are not updated by the driver when this response is analysed because the attributes corresponding to these locations were not reported in the response to the query.

* Room for up two three numbers for attributes like value, peak but in this case only two values are relevant for this device.

[5] Locations marked with a 1 are updated when the driver analyses this response

Appendix A.20. Using Clist to Write-Through and Store point status from Unsolicited Messages

From version 1.05 on the functionality of the 'clist' Map Descriptor's has been enhanced.

The 'Clist' Map Descriptors can
- Read a point's status
- Write to a point when a Write-Through is activated
- Store the point status when an 'xpoint' unsolicited message is received from the panel.

A Write-Through occurs when a Data Array value that is normally updated by a read (rdbc) Map Descriptor is updated by some other driver or by using the Ruinet application.

In this case the updated value is written through the read Map Descriptor and the Simplex 4100 driver writes the updated value to the panel. The value is written once only each time that the Data Array element is updated except when the value is updated by the response to the read or if the point status is updated when an unsolicited message is received from the panel.
Ensure that:
- The point is not a read only point
- The Panel's access level has been set appropriately.

When an unsolicited message is received from the panel it would normally be stored using a Map Descriptor with the 'xpoint' function. (See section 4.5.6) However, if you are polling for the status of that point using a 'Clist' Map Descriptor and if that Map Descriptor has 'Store_Unsolicited' set to yes then you must omit the 'xpoint' Map Descriptor as the 'Clist' Map Descriptor can be used to store the point status when it is updated with an unsolicited message. If you have both Map Descriptor's defined then the result will be unpredictable.

A write command can be sent to a Simplex panel in one of two formats:
1) SET c-p-s ON/OFF (default)
2) SET c-p-s value

Use the sim4100_WriteThru parameter in the CSV to change to the 2nd format.

Even if you are writing to an analog pseudo point using format 1 is suitable because by enabling the point you force it to take its intrinsic value. By setting the point off you are setting its value to zero.

Appendix B. Troubleshooting Tips

Appendix B.1. Address Errors

If the driver produces BAD_ADDRESS stats then do the following

- Read the notes on processing errors. You can see the last error response and a report of the MD's which received the error response in the error array.
- Alternatively, take a log, open the ASCII version of the log and look for error messages. Error 2 is the response sent by the panel when it is polled for a point that doesn't exist. Find the Error #2's n the log. Now look at the line which precedes the error. It is the poll. Look to see which point in being polled. Now you know the c-p-s of the invalid point, edit the configuration and remove the MD which polls for data at that point. When you have finished editing the configuration, download the modified file and reset the FS for the changes to take effect.

Appendix B.2. Driver Limitations

- Other than being able to write through a Map Descriptor where the sim4100_func='clist' , write throughs are not supported by this driver.
- Port expansion is not supported.

Appendix B.3. Resolving Network Addresses above 255

The Standard format for addressing a simplex point is c-p-s (Card-Point-Subpoint). Each of these components in the address supports a maximum value of 255. However, when using an NDU (Network Display Unit), addresses may be supplied in a Card-Address format where the address value could be substantially larger than 255. In these applications it will be necessary to convert the Card-Address format into c-p-s format before configuring the points in the FieldServer.

The formula used to convert between the two formats is as follows:

Card is the same for both formats.
Network Address = ((Point-1)*256) + Sub-Point + 1

This conversion procedure is best illustrated by means of an example:

Example:
Card–Address point supplied = 5-2936

From this we deduce the card number to be 5. The next step is to break the address into multiples of 256 in order to determine point and sub-point. Since this is also a hex denominated calculation, an easy way to do this is to convert the value to Hex:

2936 = 0xB78

Now, break out the last two hex numbers for sub-point portion, and use the rest for point address. So we get:

0xB = 11 = (Point-1)
0x78 = 120 = Sub-Point + 1

Solving this equation, we get:

Point = 12
Sub-Point = 119

Appendix C. Error Messages

Error Message	Troubleshooting Tip
Sim4100:#1 <card><point><sub> invalid for ack. Read manual.	The card-point-sub is being used to derive an array offset. The calculation requires division by the point & the sub and one or both of these values are zero.
Sim4100:#2 RTS has been asserted for too long. Extend timer, check cable uses RTS/CTS or reconfig 4100 device to suppress hardware handshaking	If RTS-CTS handshaking has been used then this message is produced if the driver finds that the RTS has been asserted by the slave device for too long. The timeout is hard coded at 2.0s.
Sim4100:#3 sim4100_chan_init() Init with null chan.	Requires support from FieldServer Technologies.
Sim4100:#4 Unknown sim4100_func in csv <nnn>	The driver has found a value for a sim4100_func keyword that it does not recognize. Check the CSV file and read Appendix A.2 of this manual for a list of legal keywords.
Sim4100:#5 Use Ackall function.	The sim4100_func keyword has been assigned the value 'ack' but a card-point-sub has not been specified. It would be better to use the ackall function instead.
Sim4100:#6 ack/ackall/seta/setd must be a write.	You cannot use the rdbc function with these keywords. Use a wrbc instead.
Sim4100:#7 disable/restart/list not implemented	You cannot use these keywords at the present time. If you require one of these functions implemented call FieldServer Technologies.
Sim4100:#8 Func=Clistall/Clist, wrbc not allowed	These keywords must be used with a rdbc instead.
Sim4100:#9 Write ack was not expected.	Please report this error to FieldServer Technologies.
Sim4100:#10 Invalid point status <s><v><a>=(Hex)<%x><%x><%x> <%c><%c><%c>	Please report his message to FieldServer Technologies noting the values in braces.
Sim4100:#11. Error. Array too short. rqd= %d(max= %d) act= %d. MapDesc= <%s> Data Abandoned! Subsequent msgs suppressed!	Check the CSV file Data Array lengths.
Sim4100:#12 Error.	Incoming data is being abandoned.
Subsequent message supressed!	Check the CSV file; there was no matching Map Descriptor for a message.
Sim4100:#13 FYI. Login Function not Implemented.	Please contact FieldServer Technologies if you would like this feature implemented.

Error Message	Troubleshooting Tip
Sim4100:#14 MD=%s Addr=%d	A write thru is defined as follows. The FieldServer reads data from a device and stores it in a Data Array. If a remote device changes the value in that Data Array, the FieldServer will write the new value to the device that is being read. This driver does not permit write thru's except when the data is being updated using CLIST. Refer also to Sections 4.5.4, 4.5.6 and Appendix A.20. In versions of the driver up to and including 1.07a a panic is produced when this message is printed. The message is printed to a maximum of 10 times and then suppressed.
SIM4100:#15 FYI. Incoming abandoned. No Map Desc.	Check the CSV file; there was no matching Map Descriptor for a message.
SIM4100:#16 FYI. No Map Desc. Respond with Error.	If the server can't find a matching MD (i.e. the point being polled for doesn't exist) then the driver responds with Simplex Error #2.
SIM4100:#17 FYI. Incoming Abandoned. No Data.	Check the driver manual and Simplex User Manuals. There is no driver response to the message received.
SIM4100:#18 FYI. Incoming Abandoned. (%d)	Please report his message to FieldServer Technologies noting the values in braces.
Sim4100:#19a FYI. Sim4100 Firmware found (%.2f)	No corrective action is required on your part. The message is printed for your information only. Message 'a' is printed when version 9 firmware is found in the panel. Message 'b' is printed when version 10 firmware is found in the panel. Message 'b' is printed when version 11 firmware is found in the panel.
Sim4100:#19d FYI. Panel Firmware Rev %.2f may be incompatible.	The firmware version found is not one that the driver explicitly supports. This does not mean the driver will not work but if a feature of the driver isn't working correctly knowing that the firmware version is not supported may help diagnose the problem more easily. No corrective action is required on your part. If however, some you suspect that the driver is not operating correctly it is important that you mention seeing this message in the Error Buffer when reporting the problem.

Error Message	Troubleshooting Tip
Sim4100:#19e FYI. Panel Firmware may be incompatible.	The format of the firmware version information could not be interpreted correctly. This may mean that your panel has a firmware version that is not one that the driver explicitly supports. This does not mean the driver will not work but if a feature of the driver isn't working correctly knowing that the firmware version is not supported may help diagnose the problem more easily. No corrective action is required on your part. If however, some you suspect that the driver is not operating correctly it is important that you mention seeing this message in the Error Buffer when reporting the problem.
Sim4100:#20 FYI. Data abandoned! Array too short. MapDesc= <%s>	Check the CSV file Data Array lengths.
Sim4100:#21. Error. Data abandoned! Array too short c-p-s= %d-%d-%d	Check the CSV file Data Array lengths.
Sim4100:#22. FYI. Polling Inhibited.	Polling is disabled until the port supervision message has been received. This message can be safely ignored. When the panel sends unsolicited messages to the FieldServer this message is printed. Polling remains inhibited until the unsolicited message stream end.
Sim4100:#23. FYI. Polling Enabled	When a stream of unsolicited messages is received from the Simplex panel then polling is inhibited until the stream ends. When the stream ends this message is printed. It may be safely ignored.
Sim4100:#25. Error. Data abandoned! Array too short c-p-s= %d-%d-%d	Check the CSV file Data Array lengths.
Sim4100:#26 FYI. Data abandoned! Array too short.(%d) MapDesc=<%s>	Check the CSV file Data Array lengths.
Sim4100:#27. FYI. Sequence Number reset requested & done.	
Sim4100:#28. Error. Bad Sim4100_Func=%d in MD=<%s>	Check the CSV file and driver manual for valid Simplex functions.
Sim4100:#29. FYI. Length changed to 1 in MapDesc= <%s>	Check the CSV file for the correct Map Descriptor function type.
Sim4100:#30. FYI. Length changed to 1 in MapDesc= <%s>	Check the CSV file for the correct Map Descriptor function type.
Sim4100:#31. FYI. Length changed to 1 in MapDesc= <%s>	Check the CSV file for the correct Map Descriptor function type.
Sim4100:#32. FYI. Sequence number semi-reset.	

Error Message	Troubleshooting Tip
Sim4100:#33. Error. Invalid Seq Number.	Message sequence numbers incorrect. Check Simplex User Manuals, and driver manuals. Contact FieldServer Technologies for additional support.
Sim4100:#34. Bad Seq. Sequence number reset.	Message sequence number incorrect. Check Simplex User Manuals, and driver manuals. Contact FieldServer Technologies for additional support.
Sim4100:#36. FYI. Bad sim4100_func=%d in MapDesc=<%s>	Check the CSV file for the correct Simplex function type.
Sim4100:#38. FYI. Bad sim4100_func=%d in MapDesc=<%s>	Check the CSV file for the correct Simplex function type.
Sim4100:#39 FYI. Data abandoned! State not recognized. Mapdesc=<%s>	Attribute was found, but State not found in driver table. Contact FieldServer Technologies for additional support.
Sim4100:#40 FYI. Data abandoned! Array too short.(%d) Mapdesc=<%s>	Check the CSV file Data Array lengths
Sim4100:#41 FYI. Data abandoned! Array too short.(%d) Mapdesc=<%s>	Check the CSV file Data Array lengths
Sim4100:#43. Err. Can only monitor %d point(s) for ClearAll	Contact FieldServer Technologies for additional support.
Sim4100:#44 FYI. ClearAll mapDesc's must be passive	Map Descriptor function has been changed automatically
Sim4100:#45 FYI. User added SHOW attribute=<%s> offset=%d method=%d	
Sim4100:#46 Err. No space. Driver rejects SHOW attribute=<%s> offset=%d method=%d	No space is available in internal driver table. Contact FieldServer Technologies for additional support.
Sim4100:#47 Err. Duplicate. Driver rejects SHOW attribute=<%s> offset=%d method=%d	Duplicate found in internal driver table. Contact FieldServer Technologies for additional support.
Sim4100:#48 FYI. User added SHOW attr state=<%s> value=%d	
Sim4100:#49 Err. No space. Driver rejects SHOW attr state=<%s> value=%d	No space is available in internal driver table. Contact FieldServer Technologies for additional support.
Sim4100:#50 Err. Duplicate. Driver rejects SHOW attr state=<%s> value=%d	Duplicate found in internal driver table. Contact FieldServer Technologies for additional support.
sim4100:#51 Err. Length must be specified and > 0.	Check the CSV file for the length fields.
SIM4100:#52 FYI. Incoming Abandoned. Node offline	Check the CSV file for node definitions, Simplex hardware, and connections. A device node appears to be offline. Contact FieldServer Technologies for additional support.
Sim4100:#53. Md=<%s> Abandoned. Polling was inhibited.	Obsolete. Contact FieldServer Technologies for support.

Error Message	Troubleshooting Tip
Sim4100:#54. Err. SeqNumber check disabled.	Sequence number checking was disabled. Check your password. Contact FieldServer Technologies for support.
Sim4100:#55. Error. Bad Sim4100_Func=%d in MD=<%s>	Check the CSV file for the correct Simplex function type.
Sim4100:#56	Not used.
Sim4100:#57* Err. Cant parse Login message. Ignored.	The driver ignored Login messages. No corrective action is required. This message is printed for your information only.
Sim4100:#58 FYI. You could have used an Array called <%s> to expose diagnostic info.	This message is printed for your information only. It can safely be ignored. For additional information read section “Appendix A.7.2 Driver Exposed Stats”
Sim4100:#59 Err. Checkpoint. Report this to Tech Support.	An internal driver diagnostic has been triggered. You must report this error to FieldServer’s Technical Support.
Sim4100:#60 Err. MapDesc=%s. No Node.	Every Sim4100 Map Descriptor must be connected to a node. Ensure that the parameter ‘Node_Name’ has been specified on the Map Descriptor. To correct this problem, edit the CSV, make the correction, download the corrected CSV file and reset the FieldServer.
Sim4100:#61 Err. PLC_Type=4100u rqd for 'values'/'earths'	If you have a Map Descritor which has the sim4100_func parameter set to ‘earths’ or to ‘values’ then you must set the PLC_Type parameter on the node to 4100U. (See section 0 Client Side Node Descriptors). It is only appropriate to do so if the firmware version of your panel is 10.x or later. You can create a map descriptor to read the version information if you are not sure. You can also use the menu system on the Panel to read the version number. To correct this problem, edit the CSV, make the correction, download the corrected CSV file and reset the FieldServer.
Sim4100:#62 Err. Input Buffer Overflow.	This message is printed when the input buffer overflows. This usually occurs when the panel sends lots of messages and they are not being processed by the driver fast enough. A panic is printed immediate after this message. The driver will clear the buffer and start capturing new bytes as they arrive. Messages may have been lost. We advise that you re-synch the panel. This error has only been seen once. It occurred when a panel was connected to the driver with the wrong connection settings.

Appendix D. Pseudo Points

It is beyond the scope of the driver manual to describe the full functionality of the Simplex Panels. However, we have found it useful to provide the following data to customers. The following information is not maintained and updated therefore you should use it for reference only and should always consult with the vendor of your Simplex system before implementing any project decisions or actions based on the information provided in this section.

Pseudo points are points that report states or attributes based on how the Simplex system has been installed, configured and programmed. They are often programmed to groups, devices, zones or other logic groupings. For example, a pseudo point may be programmed to report if and only if more than one sensor in a particular area is reporting smoke.

Every Simplex system has a number of default pseudo points programmed into the firmware supplied with the panel. These default points depend only on the firmware revision number and are generally unaffected by the configuration programmed for a particular site.

Although the 4100 card number can range from 0-250 in theory, only the following ranges are presently used in the system:

Card address	Card type
0-119	Physical (Hardware) cards
128-143	Digital Pseudo cards
144-159	Analog Pseudo cards
160-175	List Pseudo cards

Digital Pseudo's: There are 250 fixed pseudo's in the 4020 panel and 511 in the 4100 and 4100U. The numbering sequence is simple, 128 starts the first block of 256 (0 to 255), so the first point is 128-0-0, the second is 128-1-0, and so on. The next block starts at 129 and follows the same sequence, then 130 and so on up to 143. In the 4100 the first user definable pseudo is P-256, in the 4100U it's P-512.

P0	SYSTEM RESET KEY	UTILITY	128-0-0
P1	ALARM SILENCE KEY	UTILITY	128-1-0
P2	FRONT PANEL LAMPTEST CONTROL (ANNUNC. 0)	UTILITY	128-2-0
P3	FIRE ALARM DETECT	UTILITY	128-3-0
P4	GLOBAL ACKNOWLEDGE ENABLE	UTILITY	128-4-0
P5	SET SERVICE PSEUDO VALUES	UTILITY	128-5-0
P6	ALARM SILENCE	UTILITY	128-6-0
P7	EXTRA CARD IN THE SYSTEM	TROUBLE	128-7-0
P8	KEYPAD ACTIVE	UTILITY	128-8-0
P9	SYSTEM OUT OF CQB'S	TROUBLE	128-9-0
P10	CODED INPUT ACTIVE	UTILITY	128-10-0
P11	UNACKNOWLEDGED FIRE ALARM EXISTS	UTILITY	128-11-0
P12	UNACKNOWLEDGED SUPERVISORY EXISTS	UTILITY	128-12-0
P13	UNACKNOWLEDGED TROUBLE EXISTS	UTILITY	128-13-0
P14	SYSTEM DISABLED - PROGRAMMER DOWNLOAD	TROUBLE	128-14-0
P15	CFIG RAM WRITE PROTECT MISSING (SW1-1)	TROUBLE	128-15-0
P16	SMPL PROGRAM 0 - SYSTEM DEFAULT	UTILITY	128-16-0

P17	SMPL PROGRAM 1 - DEFAULT AUDIO	UTILITY	128-17-0
P18	SMPL PROGRAM 2 - SYSTEM OPTIONS (CODING)	UTILITY	128-18-0
P19	SMPL PROGRAM 3 - USER CUSTOM CONTROL	UTILITY	128-19-0
P20	SMPL PROGRAM 4 - USER CUSTOM CONTROL	UTILITY	128-20-0
P21	SMPL PROGRAM 5 - USER CUSTOM CONTROL	UTILITY	128-21-0
P22	SMPL PROGRAM 6 - USER CUSTOM CONTROL	UTILITY	128-22-0
P23	SMPL PROGRAM 7 - USER CUSTOM CONTROL	UTILITY	128-23-0
P24	CODING GROUP 0 ACTIVE	UTILITY	128-24-0
P25	CODING GROUP 1 ACTIVE	UTILITY	128-25-0
P26	CODING GROUP 2 ACTIVE	UTILITY	128-26-0
P27	CODING GROUP 3 ACTIVE	UTILITY	128-27-0
P28	CODING GROUP 4 ACTIVE	UTILITY	128-28-0
P29	CODING GROUP 5 ACTIVE	UTILITY	128-29-0
P30	CODING GROUP 6 ACTIVE	UTILITY	128-30-0
P31	CODING GROUP 7 ACTIVE	UTILITY	128-31-0
P32	COLD START	TROUBLE	128-32-0
P33	WARM START	TROUBLE	128-33-0
P34	CITY DISCONNECT	TROUBLE	128-34-0
P35	MANUAL EVACUATION SWITCH INPUT	UTILITY	128-35-0
P36	ELEVATOR BYPASS	TROUBLE	128-36-0
P37	DOORHOLDER BYPASS	TROUBLE	128-37-0
P38	CONTROL POINT BYPASS	TROUBLE	128-38-0
P39	SYSTEM EXECUTING FROM RAM	TROUBLE	128-39-0
P40	AUTOMATIC DETECTOR RESET	UTILITY	128-40-0
P41	MASTER FIRE ALARM ACK KEY	UTILITY	128-41-0
P42	MASTER SUPERVISORY ACK KEY	UTILITY	128-42-0
P43	MASTER TROUBLE ACK KEY	UTILITY	128-43-0
P44	CODING BUS DISABLE SWITCH	UTILITY	128-44-0
P45	DRILL SWITCH INPUT	UTILITY	128-45-0
P46	DOOR HOLDER TRIGGER	UTILITY	128-46-0
P47	SIGNALS/VISUALS ACTIVE	UTILITY	128-47-0
P48	MANUAL EVACUATION	FIRE	128-48-0
P49	SYSTEM AT ACCESS LEVEL 1 OR GREATER	UTILITY	128-49-0
P50	SYSTEM AT ACCESS LEVEL 2 OR GREATER	UTILITY	128-50-0
P51	SYSTEM AT ACCESS LEVEL 3 OR GREATER	UTILITY	128-51-0
P52	SYSTEM AT ACCESS LEVEL 4	UTILITY	128-52-0
P53	SYSTEM LIST OVERFLOW - WARM START NEEDED	TROUBLE	128-53-0
P54	NETWORK MIKE KEYED	UTILITY	128-54-0
P55	CRT KEYPAD INACTIVITY TIMER DISABLE	UTILITY	128-55-0
P56	CITY CIRCUIT STD TROUBLE RELAY OPERATION	UTILITY	128-56-0
P57	KEYPAD INACTIVITY TIMER DISABLE	UTILITY	128-57-0
P58	SYSTEM TIME/DATE INVALID OR NOT SET	TROUBLE	128-58-0
P59	ALARM VERIFICATION TALLY LIMIT EXCEEDED	TROUBLE	128-59-0
P60	ALARM VERIFICATION GROUP 0 ACTIVE	UTILITY	128-60-0
P61	ALARM VERIFICATION GROUP 1 ACTIVE	UTILITY	128-61-0
P62	ALARM VERIFICATION GROUP 2 ACTIVE	UTILITY	128-62-0
P63	ALARM VERIFICATION GROUP 3 ACTIVE	UTILITY	128-63-0

P64	ALARM VERIFICATION GROUP 4 ACTIVE	UTILITY	128-64-0
P65	ALARM VERIFICATION GROUP 5 ACTIVE	UTILITY	128-65-0
P66	ALARM VERIFICATION GROUP 6 ACTIVE	UTILITY	128-66-0
P67	ALARM VERIFICATION GROUP 7 ACTIVE	UTILITY	128-67-0
P68	FIRST STAGE TIMER EXPIRED	UTILITY	128-68-0
P69	THE EVAC MESSAGE HAS PLAYED	UTILITY	128-69-0
P70	WALK TEST GROUP 0 ENABLED	TROUBLE	128-70-0
P71	WALK TEST GROUP 1 ENABLED	TROUBLE	128-71-0
P72	WALK TEST GROUP 2 ENABLED	TROUBLE	128-72-0
P73	WALK TEST GROUP 3 ENABLED	TROUBLE	128-73-0
P74	WALK TEST GROUP 4 ENABLED	TROUBLE	128-74-0
P75	WALK TEST GROUP 5 ENABLED	TROUBLE	128-75-0
P76	WALK TEST GROUP 6 ENABLED	TROUBLE	128-76-0
P77	WALK TEST GROUP 7 ENABLED	TROUBLE	128-77-0
P78	ALARM SILENCE/ALARM CUTOUT PSEUDO	UTILITY	128-78-0
P79	RESET SPKRS WHEN AUDIO CODING COMPLETE	UTILITY	128-79-0
P80	MASTER MICROPHONE KEYED	UTILITY	128-80-0
P81	REMOTE MICROPHONE 1 KEYED	UTILITY	128-81-0
P82	REMOTE MICROPHONE 2 KEYED	UTILITY	128-82-0
P83	REMOTE MICROPHONE 1 READY TO TALK	UTILITY	128-83-0
P84	REMOTE MICROPHONE 2 READY TO TALK	UTILITY	128-84-0
P85	VTG 1 - ACTIVE	UTILITY	128-85-0
P86	VTG 2 - ACTIVE	UTILITY	128-86-0
P87	EVACUATION MESSAGE ON	UTILITY	128-87-0
P88	EVACUATION MESSAGE OFF	UTILITY	128-88-0
P89	EVACUATION MESSAGE LED	UTILITY	128-89-0
P90	ALERT MESSAGE ON	UTILITY	128-90-0
P91	ALERT MESSAGE OFF	UTILITY	128-91-0
P92	ALERT MESSAGE LED	UTILITY	128-92-0
P93	DRILL MESSAGE ON	UTILITY	128-93-0
P94	DRILL MESSAGE OFF	UTILITY	128-94-0
P95	DRILL MESSAGE LED	UTILITY	128-95-0
P96	ALL CLEAR MESSAGE ON	UTILITY	128-96-0
P97	ALL CLEAR MESSAGE OFF	UTILITY	128-97-0
P98	ALL CLEAR MESSAGE LED	UTILITY	128-98-0
P99	AUX MSG 1 ON	UTILITY	128-99-0
P100	AUX MSG 1 OFF	UTILITY	128-100-0
P101	AUX MSG 1 LED	UTILITY	128-101-0
P102	AUX MSG 2 ON	UTILITY	128-102-0
P103	AUX MSG 2 OFF	UTILITY	128-103-0
P104	AUX MSG 2 LED	UTILITY	128-104-0
P105	PHONE PAGING ON	UTILITY	128-105-0
P106	PHONE PAGING OFF	UTILITY	128-106-0
P107	PHONE PAGING LED	UTILITY	128-107-0
P108	AUDIO OVERRIDE ON	UTILITY	128-108-0
P109	AUDIO OVERRIDE OFF	UTILITY	128-109-0
P110	AUDIO OVERRIDE TROUBLE	TROUBLE	128-110-0

P111	ALL SPEAKERS MINUS ON	UTILITY	128-111-0
P112	ALL SPEAKERS MINUS OFF	UTILITY	128-112-0
P113	ALL SPEAKERS MINUS LED	UTILITY	128-113-0
P114	ALL SPEAKERS CHANNEL 1 ON	UTILITY	128-114-0
P115	ALL SPEAKERS CHANNEL 1 OFF	UTILITY	128-115-0
P116	ALL SPEAKERS CHANNEL 1 LED	UTILITY	128-116-0
P117	ALL SPEAKERS CHANNEL 2 ON	UTILITY	128-117-0
P118	ALL SPEAKERS CHANNEL 2 OFF	UTILITY	128-118-0
P119	ALL SPEAKERS CHANNEL 2 LED	UTILITY	128-119-0
P120	ALL SPEAKERS CHANNEL 3 ON	UTILITY	128-120-0
P121	ALL SPEAKERS CHANNEL 3 OFF	UTILITY	128-121-0
P122	ALL SPEAKERS CHANNEL 3 LED	UTILITY	128-122-0
P123	LOCAL SPEAKER EVAC ON	UTILITY	128-123-0
P124	LOCAL SPEAKER EVAC OFF	UTILITY	128-124-0
P125	LOCAL SPEAKER EVAC LED	UTILITY	128-125-0
P126	LOCAL SPEAKER ALERT ON	UTILITY	128-126-0
P127	LOCAL SPEAKER ALERT OFF	UTILITY	128-127-0
P128	LOCAL SPEAKER ALERT LED	UTILITY	128-128-0
P129	ALL SPEAKERS TALK ON	UTILITY	128-129-0
P130	ALL SPEAKERS TALK OFF	UTILITY	128-130-0
P131	ALL SPEAKERS TALK LED	UTILITY	128-131-0
P132	ANALOG SENSOR ALMOST DIRTY LOG ENABLE	TROUBLE	128-132-0
P133	LOG ANALOG SENSOR PEAK VALUE ENABLE	UTILITY	128-133-0
P134	CLEAR ANALOG SENSOR PEAK VALUE	TROUBLE	128-134-0
P135	ALL ALERT	UTILITY	128-135-0
P136	ALL EVAC	UTILITY	128-136-0
P137	ALL ALERT LED	UTILITY	128-137-0
P138	MASTER MIKE PRETONE PLAYING ON VTG2	UTILITY	128-138-0
P139	REMOTE MIKE 1 PRETONE PLAYING ON VTG2	UTILITY	128-139-0
P140	REMOTE MIKE 2 PRETONE PLAYING ON VTG2	UTILITY	128-140-0
P141	MANUAL AUDIO EVAC ON	UTILITY	128-141-0
P142	MANUAL AUDIO EVAC OFF	UTILITY	128-142-0
P143	MANUAL AUDIO EVAC LED	UTILITY	128-143-0
P144	DISABLE SUPERVISION ON VTG 1 (2120 APPL)	UTILITY	128-144-0
P145	DISABLE SUPERVISION ON VTG 2 (2120 APPL)	UTILITY	128-145-0
P146	EMPTY AUDIO SERVICE QUEUE	UTILITY	128-146-0
P147	EVAC MSG PLAYING WHEN MICROPHONE KEYED	UTILITY	128-147-0
P148	SYSTEM OUT OF AQB'S	TROUBLE	128-148-0
P149	SPEAKER SWITCH OFF AUTO	TROUBLE	128-149-0
P150	AUDIO CODING GROUP 1 ACTIVE	UTILITY	128-150-0
P151	AUDIO CODING GROUP 2 ACTIVE	UTILITY	128-151-0
P152	VTG 1 - AUDIO SUPERVISION ACTIVE	UTILITY	128-152-0
P153	VTG 2 - AUDIO SUPERVISION ACTIVE	UTILITY	128-153-0
P154	PHONE TALK LINE RELAY FEEDBACK	UTILITY	128-154-0
P155	PHONE NETWORK RELAY FEEDBACK	UTILITY	128-155-0
P156	LOCAL MASTER PHONE HANDSET OFF HOOK	UTILITY	128-156-0
P157	PHONE TALK LINE RELAY CONTROL INPUT	UTILITY	128-157-0

P158	PHONE NETWORK RELAY CONTROL INPUT	UTILITY	128-158-0
P159	PHONE TALK LINE RELAY CONTROL	UTILITY	128-159-0
P160	PHONE NETWORK RELAY CONTROL	UTILITY	128-160-0
P161	MASTER PHONE OFFHOOK SUPERVISION	TROUBLE	128-161-0
P162	MASTER MIKE PRETONE PLAYING ON VTG1	UTILITY	128-162-0
P163	REMOTE MIKE 1 PRETONE PLAYING ON VTG1	UTILITY	128-163-0
P164	REMOTE MIKE 2 PRETONE PLAYING ON VTG1	UTILITY	128-164-0
P165	AMPS SWITCHED TO BATTERY	UTILITY	128-165-0
P166	ENABLE RM PHONE TO RM PHONE CONVERSATION	UTILITY	128-166-0
P167	ALERT MSG PLAYING WHEN MICROPHONE KEYED	UTILITY	128-167-0
P168	MICROPHONE TO EVAC IN EFFECT	UTILITY	128-168-0
P169	MICROPHONE TO ALERT IN EFFECT	UTILITY	128-169-0
P170	MICROPHONE TO TALK (CHANNEL 3) IN EFFECT	UTILITY	128-170-0
P171	BACKGROUND MUSIC RELAY CHANNEL 1	UTILITY	128-171-0
P172	BACKGROUND MUSIC RELAY CHANNEL 2	UTILITY	128-172-0
P173	BACKGROUND MUSIC RELAY CHANNEL 3	UTILITY	128-173-0
P174	VTG 1 CODE'S PRECODE PLAYING	UTILITY	128-174-0
P175	VTG 1 CODE'S AFTER CODE PLAYING	UTILITY	128-175-0
P176	AFTER CODE START - VTG 1	UTILITY	128-176-0
P177	VTG 1 'QUIET' MESSAGE PLAYING	UTILITY	128-177-0
P178	VTG 2 CODE'S PRECODE PLAYING	UTILITY	128-178-0
P179	VTG 2 CODE'S AFTER CODE PLAYING	UTILITY	128-179-0
P180	AFTER CODE START - VTG 2	UTILITY	128-180-0
P181	VTG 2 'QUIET' MESSAGE PLAYING	UTILITY	128-181-0
P182	(2120 APPL) VTG1 CODE START	UTILITY	128-182-0
P183	(2120 APPL) STOP VTG1 QUEUE	UTILITY	128-183-0
P184	(2120 APPL) VTG2 CODE START	UTILITY	128-184-0
P185	(2120 APPL) STOP VTG2 QUEUE	UTILITY	128-185-0
P186	MIKE DISABLE	UTILITY	128-186-0
P187	VTG & AMPLIFIER TROUBLE DISABLE	UTILITY	128-187-0
P188	VTG SUPERVISION TONE NOT ACTIVE	TROUBLE	128-188-0
P189	SATELLITE PHONE TIMEOUT DISABLE	UTILITY	128-189-0
P190	NETWORK MIKE PRETONE PLAYING	UTILITY	128-190-0
P191	MASTER MIKE KEYED	UTILITY	128-191-0
P192	REMOTE MIKE 1 KEYED	UTILITY	128-192-0
P193	REMOTE MIKE 2 KEYED	UTILITY	128-193-0
P194	MIKES ARE READY TO PAGE	UTILITY	128-194-0
P195	S21 SWITCH ACTIVATED	UTILITY	128-195-0
P196	RAM BATTERY MISSING/FAILED	TROUBLE	128-196-0
P197	2120 1 COMM LOSS	UTILITY	128-197-0
P198	INHIBIT SONALERT	UTILITY	128-198-0
P199	INHIBIT ALARM DEFAULT	UTILITY	128-199-0
P200	FORCE COLD START	UTILITY	128-200-0
P201	AC VOLTAGE FAILURE/BROWNOUT	UTILITY	128-201-0
P202	DETECTOR RESET	UTILITY	128-202-0
P203	LCD ANNUNCIATORS OVERRIDE KEYSWITCH	UTILITY	128-203-0
P204	SIGNALS SILENCED	UTILITY	128-204-0

P205	TRUEALARM SENSITIVITY MODIFIED	TROUBLE	128-205-0
P206	PRINT QUEUE OVERFLOW	TROUBLE	128-206-0
P207	NETWORK DIAGNOSTIC MODE	TROUBLE	128-207-0
P208	OUT OF NQB'S	TROUBLE	128-208-0
P209	COMMUNICATIONS SHORT CIRCUIT TROUBLE	TROUBLE	128-209-0
P210	NETWORK DETECTOR RESET	UTILITY	128-210-0
P211	NETWORK SYSTEM RESET	UTILITY	128-211-0
P212	DETECTOR/SYSTEM RESET	UTILITY	128-212-0
P213	4120 NETWORK CARD CONFIGURED	UTILITY	128-213-0
P214	CLEAR VERIFICATION TALLIES	TROUBLE	128-214-0
P215	PRIORITY 2 ALARM DETECT	UTILITY	128-215-0
P216	PRIORITY 2 ALARM RESET REQUEST	UTILITY	128-216-0
P217	NETWORK SIGNAL SILENCE	UTILITY	128-217-0
P218	UNACKNOWLEDGED PRIORITY 2 ALARM EXISTS	UTILITY	128-218-0
P219	MASTER PRIORITY 2 ALARM ACK KEY	UTILITY	128-219-0
P220	NETWORK PRIORITY 2 RESET	UTILITY	128-220-0
P221	SIGNALS ACTIVE - OFF ON SILENCE	UTILITY	128-221-0
P222	REMOTE DOWNLOAD ENABLED	TROUBLE	128-222-0
P223	MASTER MICROPHONE READY TO TALK	UTILITY	128-223-0
P224	NETWORK INITIALIZATION INCOMPLETE	TROUBLE	128-224-0
P225	NETWORK OPERATING IN DEGRADED STYLE-7	TROUBLE	128-225-0
P226	NETWORK INITIALIZATION IN PROGRESS	TROUBLE	128-226-0
P227	SDACT DATABASE VERSION MISMATCH	TROUBLE	128-227-0
P228	PREVENT TIME/DATE LOGGING	UTILITY	128-228-0
P229	TRUEALERT SILENT TEST ACTIVE	TROUBLE	128-229-0
P230	TRUEALERT DEVICE TEST MODE ACTIVE	TROUBLE	128-230-0
P231	EXTRA NODE ON NETWORK	TROUBLE	128-231-0
P232	NETWORK POINT LABEL UPDATING INHIBITED	TROUBLE	128-232-0
P250	ENABLE END PAIR AND MONITOR LOGGING	UTILITY	128-250-0

Analog Pseudo's do not have alarm states, they have physical values such as the day, date, time, number of fire events, number of troubles and so on.

A0	NUMBER OF SYSTEM FIRE ALARMS	ANALOG	144-0-0
A1	NUMBER OF SYSTEM SUPERVISORIES	ANALOG	144-1-0
A2	NUMBER OF SYSTEM TROUBLES	ANALOG	144-2-0
A3	NUMBER OF OLD (UNCLEARED) FIRE ALARMS	ANALOG	144-3-0
A4	NUMBER OF OLD (UNCLEARED) SUPERVISORIES	ANALOG	144-4-0
A5	NUMBER OF OLD (UNCLEARED) TROUBLES	ANALOG	144-5-0
A6	CURRENT HOUR	ANALOG	144-6-0
A7	CURRENT MINUTE	ANALOG	144-7-0
A8	CURRENT SECOND	ANALOG	144-8-0
A9	CURRENT DAY	ANALOG	144-9-0
A10	CURRENT MONTH	ANALOG	144-10-0
A11	CURRENT YEAR	ANALOG	144-11-0
A12	CURRENT ACCESS LEVEL	ANALOG	144-12-0
A13	ACCESS LEVEL TIMEOUT	TIMER	144-13-0

A14	SYSTEM RESET WINDOW TIMER	TIMER	144-14-0
A15	SYSTEM RESET WINDOW TIMER SETPOINT	ANALOG	144-15-0
A16	DETECTOR RESET PULSE TIMER	TIMER	144-16-0
A17	4-WIRE RESET RELAY PULSE TIMER	TIMER	144-17-0
A18	FIRE ALARM CLEAR DELAY TIMER	TIMER	144-18-0
A19	FIRE ALARM CLEAR DELAY TIMER SETPOINT	ANALOG	144-19-0
A20	FIRE ALARM CLEAR PULSE TIMER	TIMER	144-20-0
A21	SYSTEM RESET PULSE TIMER	TIMER	144-21-0
A22	ALARM SILENCE INHIBIT TIMER	TIMER	144-22-0
A23	ALARM SILENCE INHIBIT TIMER SETPOINT	ANALOG	144-23-0
A24	FIRE ALARM CUTOUT TIMER	TIMER	144-24-0
A25	FIRE ALARM CUTOUT TIMER SETPOINT	ANALOG	144-25-0
A26	FIRE ALARM CUTOUT SILENCE PULSE TIMER	TIMER	144-26-0
A27	TROUBLE REMINDER CYCLE TIMER	TIMER	144-27-0
A28	TROUBLE REMINDER OFF-TIME SETPOINT	ANALOG	144-28-0
A29	TROUBLE REMINDER ON-TIME SETPOINT	ANALOG	144-29-0
A30	DOOR HOLDER ALARM DROP TIMER	TIMER	144-30-0
A31	DOOR HOLDER ALARM DROP TIMER SETPOINT	ANALOG	144-31-0
A32	DOOR HOLDER BROWNOUT DROP TIMER	TIMER	144-32-0
A33	DOOR HOLDER BROWNOUT DROP TIMER SETPOINT	ANALOG	144-33-0
A34	SYSTEM STARTUP PULSE TIMER	TIMER	144-34-0
A35	FIRE ALARM AUDIBLE SIGNAL OPERATION	ANALOG	144-35-0
A36	FIRE ALARM VISUAL SIGNAL OPERATION	ANALOG	144-36-0
A37	ALARM VERIFICATION - RETARD TIME	ANALOG	144-37-0
A38	ALARM VERIFICATION - RESET TIME	ANALOG	144-38-0
A39	ALARM VERIFICATION - CONFIRMATION TIME	ANALOG	144-39-0
A40	ALARM VERIFICATION - TALLY LIMIT	ANALOG	144-40-0
A41	WALK TEST ABORT TIMEOUT SETPOINT	ANALOG	144-41-0
A42	WALK TEST REACTIVATE DELAY SETPOINT	ANALOG	144-42-0
A43	MONITOR ZONE ENABLE DELAY SETPOINT	ANALOG	144-43-0
A44	CODED INPUT TIMEOUT SETPOINT	ANALOG	144-44-0
A45	OFF TIME AFTER PNIS (NON-CONT.) CODES	ANALOG	144-45-0
A46	CITY CIRCUIT CONFIGURATION	ANALOG	144-46-0
A47	ALERT TONE/MSG AFTER MICROPHONE UNKEYED	ANALOG	144-47-0
A48	TOTAL AUDIO CHANNELS	ANALOG	144-48-0
A49	CHANNEL 1 ROUTING	ANALOG	144-49-0
A50	CHANNEL 2 ROUTING	ANALOG	144-50-0
A51	CHANNEL 3 ROUTING	ANALOG	144-51-0
A52	LOCAL ROUTING	ANALOG	144-52-0
A53	EVAC TONE/MSG AFTER MICROPHONE UNKEYED	ANALOG	144-53-0
A54	SUPERVISION MSG#	ANALOG	144-54-0
A55	EVACUATION MSG#	ANALOG	144-55-0
A56	ALERT MSG#	ANALOG	144-56-0
A57	DRILL MSG#	ANALOG	144-57-0
A58	ALL CLEAR MSG#	ANALOG	144-58-0
A59	AUX 1 MSG#	ANALOG	144-59-0
A60	AUX 2 MSG#	ANALOG	144-60-0

A61	MICROPHONE PRETONE MSG#	ANALOG	144-61-0
A62	PHONE OFFHOOK TIMER	TIMER	144-62-0
A63	PHONE CALLBACK TIMER	TIMER	144-63-0
A64	PHONE TIMEOUT TIMER	TIMER	144-64-0
A65	REMOTE MASTER PHONE TIMEOUT TIMER	TIMER	144-65-0
A66	SPEAKER SWITCH OFF AUTO COUNT	ANALOG	144-66-0
A67	AUDIO RESET PULSE TIMER	TIMER	144-67-0
A68	VTG 1 PRIORITY	ANALOG	144-68-0
A69	VTG 2 PRIORITY	ANALOG	144-69-0
A70	CHANNEL 1 ROUTING PRIORITY	ANALOG	144-70-0
A71	CHANNEL 2 ROUTING PRIORITY	ANALOG	144-71-0
A72	CHANNEL 3 ROUTING PRIORITY	ANALOG	144-72-0
A73	LOCAL SPEAKER ROUTING PRIORITY	ANALOG	144-73-0
A74	AUDIO SUPERVISION PULSE TIMER VTG1	TIMER	144-74-0
A75	AUDIO SUPERVISION PULSE TIMER VTG2	TIMER	144-75-0
A76	ENABLE/DISABLE STATISTIC GROUP	ANALOG	144-76-0
A77	ENABLE/DISABLE STATISTIC OUTPUT PORT	ANALOG	144-77-0
A78	5 SEC TIMER FOR REMOTE MASTER PHONES	TIMER	144-78-0
A79	CLEAR PEAK PULSE	ANALOG	144-79-0
A80	PRECODE MESSAGE NUMBER - VTG 1	ANALOG	144-80-0
A81	AFTER CODE MESSAGE NUMBER - VTG 1	ANALOG	144-81-0
A82	PRECODE MESSAGE NUMBER - VTG 2	ANALOG	144-82-0
A83	AFTER CODE MESSAGE NUMBER - VTG 2	ANALOG	144-83-0
A84	' QUIET' MESSAGE NUMBER	ANALOG	144-84-0
A85	2 SECOND TIMER - VTG 1	TIMER	144-85-0
A86	2 SECOND TIMER - VTG 2	TIMER	144-86-0
A87	MIKE INHIBIT TIMER	TIMER	144-87-0
A88	MIKE INHIBIT TIMER SETPOINT	ANALOG	144-88-0
A89	PHONE CALLBACK TIMER SETPOINT	ANALOG	144-89-0
A90	PHONE TIMEOUT TIMER SETPOINT	ANALOG	144-90-0
A91	VTG & AMPLIFIER TROUBLE DISABLE TIMER	TIMER	144-91-0
A92	SUPERVISION NOT ACTIVE - TBL DELAY TIMER	TIMER	144-92-0
A93	4 WIRE DETECTOR RESET EXTEND TIMER	TIMER	144-93-0
A94	ACTIVE MESSAGE NUMBER - VTG 1	ANALOG	144-94-0
A95	ACTIVE MESSAGE NUMBER - VTG 2	ANALOG	144-95-0
A96	ACTUAL CHIPSET PLUGGED INTO VTG 1	ANALOG	144-96-0
A97	ACTUAL CHIPSET PLUGGED INTO VTG 2	ANALOG	144-97-0
A98	BATTERY TROUBLE COUNTER	COUNTER	144-98-0
A99	AC POWER FAIL COUNTER	COUNTER	144-99-0
A100	SYSTEM TYPE	ANALOG	144-100-0
A101	FIRST STAGE TIMER	ANALOG	144-101-0
A102	FIRST STAGE TIMER SETPOINT	ANALOG	144-102-0
A103	MASTER MIKE 5 SECOND UNKEY DELAY	ANALOG	144-103-0
A104	REMOTE MIKE 1 5 SECOND UNKEY DELAY	ANALOG	144-104-0
A105	REMOTE MIKE 2 5 SECOND UNKEY DELAY	ANALOG	144-105-0
A106	MASTER MIKE'S PRETONE TIMER	ANALOG	144-106-0
A107	MASTER MIKE'S PRETONE SETPOINT	ANALOG	144-107-0

A108	REMOTE MIKE 1'S PRETONE TIMER	ANALOG	144-108-0
A109	REMOTE MIKE 1'S PRETONE SETPOINT	ANALOG	144-109-0
A110	REMOTE MIKE 2'S PRETONE TIMER	ANALOG	144-110-0
A111	REMOTE MIKE 2'S PRETONE SETPOINT	ANALOG	144-111-0
A112	GROUND TROUBLE COUNTER	COUNTER	144-112-0
A113	PAGING CHANNEL	ANALOG	144-113-0
A114	TRUEALARM MODIFICATION COUNTER	COUNTER	144-114-0
A115	EXCESSIVELY DIRTY (OUT OF RANGE)	ANALOG	144-115-0
A116	DIRTY SENSOR COUNTER	COUNTER	144-116-0
A117	ALMOST DIRTY COUNTER	COUNTER	144-117-0
A118	ALARMS SILENCED DELAY TIMER	TIMER	144-118-0
A119	NUMBER OF LOCAL SYSTEM POINTS' TROUBLES	COUNTER	144-119-0
A120	SYSTEM PAGING STATUS	ANALOG	144-120-0
A121	KEYPAD INACTIVITY TIMEOUT SETPOINT	ANALOG	144-121-0
A122	NUMBER OF SYSTEM PRIORITY 2 ALARMS	ANALOG	144-122-0
A123	NUMBER OF OLD (UNCLEARED) PRI2 ALARMS	ANALOG	144-123-0
A124	PRI2 RESET WINDOW TIMER	TIMER	144-124-0
A125	PRI2 RESET WINDOW TIMER SETPOINT	ANALOG	144-125-0
A126	PRI2 ALARM CLEAR DELAY TIMER	TIMER	144-126-0
A127	PRI2 ALARM CLEAR DELAY TIMER SETPOINT	ANALOG	144-127-0
A128	PRI2 ALARM CLEAR PULSE TIMER	TIMER	144-128-0
A129	PRIORITY 2 RESET PULSE TIMER	TIMER	144-129-0
A130	PRIORITY 2 RESET START TIMER	TIMER	144-130-0
A131	SUPERVISION DELAY SETPOINT CHL1	ANALOG	144-131-0
A132	SUPERVISION DELAY SETPOINT CHL2	ANALOG	144-132-0
A133	SUPERVISION NOT ACTIVE DELAY SETPOINT	ANALOG	144-133-0

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