A Sierra Monitor Company

Driver Manual

(Supplement to the FieldServer Instruction Manual)

FS-8704-26 SNMP

Version1 & Version2

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after June 2014

Driver Version:	1.04
Document Revision:	0

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1 DESCRIPTION

The SNMP-STD driver allows the FieldServer to transfer data to and from devices over Ethernet using the **SNMP Version V1 or V2c** protocol. The FieldServer can emulate a Server (SNMP Agent) or Client (NMS Network Management Station).

The FieldServer provides a generic MIB (Management Information Base) file that sets out the OID (Object Identifiers) structure. The FieldServer Enterprise ID is 6347. A selection of standard MIB-2 OID's are supported to allow interaction with popular Network Management packages.

When configured as an SNMP Agent (Server) the SNMP-STD driver allows SNMP Get, GetNext(walk) and Set commands to access Data Arrays using the Integer type. The SNMP v1 protocol does not make provision for Floats.

The SNMP-STD driver can send SNMP traps. The structure for SNMP Traps is provided in the FieldServer's generic MIB file.

The FieldServer also support custom MIBs. It supports setting a custom enterprise ID, object names and custom traps or informs. In custom configurations the FieldServer supports various data types as specified in section 6.1.

When configured as a Client, the FieldServer can read objects from the Server using Get, GetNext(walk) or GetBulk commands. The GetBulk command is very useful to transfer large amounts of data. The FieldServer can update objects in Agent using the Set command.

The FieldServer can accept any trap or inform as long as all the objects in the message are encoded with a full OID. The Client side of the driver is considered as a custom configuration.

FieldServer Mode	Nodes	Comments
Client	10	The SNMP driver can be configured to communicate with remote agents.
Server	1	The SNMP driver can be configured as a single Server Node.

2 DRIVER SCOPE OF SUPPLY

2.1 Supplied by FieldServer Technologies for this driver

FieldServer Technologies PART #	Description
FS-8915-10	UTP cable (7 foot) for Ethernet connection

2.2 Provided by the Supplier of 3rd Party Equipment

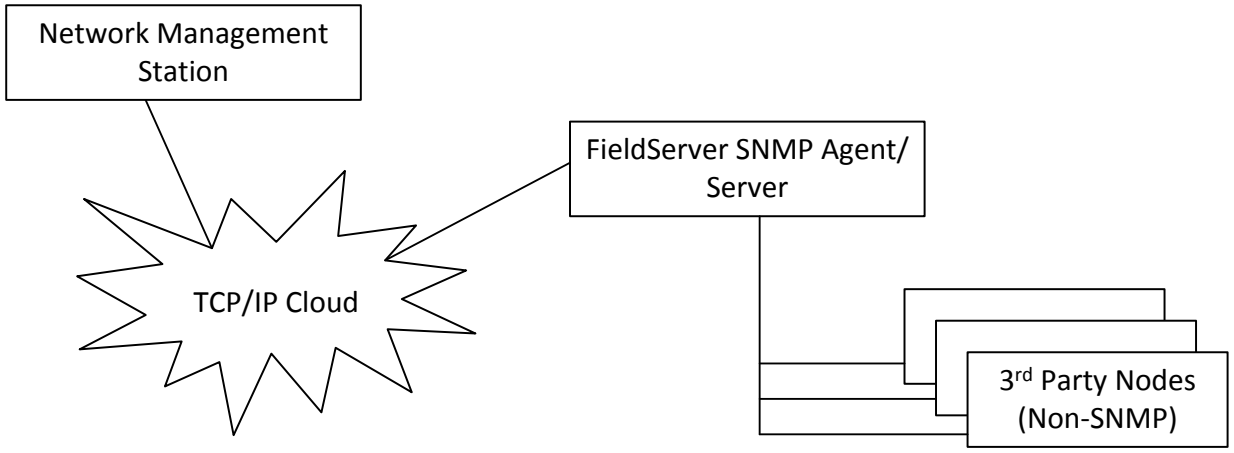
2.2.1 Required 3rd Party Hardware

Part #	Description
	Ethernet 10/100 BaseT hub*

3 HARDWARE CONNECTIONS

The FieldServer is connected to the Ethernet using the UTP cable supplied. A typical hardware configuration is shown below:

FieldServer as an SNMP Agent (Server)



3.1 Hardware Connection Tips / Hints

- Ensure that the FieldServer and all Nodes to be monitored via SNMP have the same Netmask setting.
- Default IP ports
  - Port 161 - Poll/Walk commands
  - Port 162 – Traps

* Not all FieldServer models support 100BaseT. Consult the appropriate instruction manual for details of the Ethernet speed supported by specific hardware.

4 CONFIGURING THE FIELDSERVER AS A SNMP CLIENT

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

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a SNMP Server such as a Snmp Agent application.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for SNMP 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 Client Side Data Arrays

Data Arrays are "protocol neutral" data buffers for storage of data to be passed between protocols. It is necessary to declare the data format of each of the Data Arrays to facilitate correct storage of the relevant data.

Section Title		
Data_Arrays		
Column Title	Function	Legal Values
Data_Array_Name	Provide name for Data Array	Up to 15 alphanumeric characters
Data_Array_Format	Provide data format. Each Data Array can only take on one format.	Float, Bit, Uint16, Sint16, Uint32, Sint32, Byte.
Data_Array_Length	Number of Data Objects. Must be larger than the data storage area required by the Map Descriptors for the data being placed in this array.	1-10, 000

Example

```
Data_Arrays
Data_Array_Name   , Data_Format   , Data_Array_Length
G_ALM_STAT_1      , Uint16        , 7
G_ALM_CNTR_1      , Uint16        , 6
BRN_CUR_ALM_1     , Uint16        , 253
LOCATION_1        , Byte          , 128
AUX_CNT64_        , Uint32        , 2
DA_CONFIG         , Bit           , 1
```

4.2 Client Side Connection Parameters

Section Title		
Connections		
Column Title	**Function**	**Legal Values**
Adapter	Adapter Name	N1, N2[1]
Protocol	Specify protocol used	SNMP-STD
Public_Community*	Specify the Server's public community name if the FieldServer is supposed to be in a public domain. It will be used in polls (Get/Set) if there is no Private_Community specified. This is a case sensitive parameter. Any poll with a different community could be discarded by the Server.	Any string up to 255 characters, **Public**
Private_Community*	Specify the Server's private community name if it is different than Public_Community. The FieldServer will use this community in polls (Get/Set) requests.	Any string up to 255 characters Default value is same as Public_Community
Trap_Community*	Specify the Server's trap community name if it is different than Public_Community. The FieldServer will discard any trap/inform received with an unknown community. It is case sensitive.	Any string up to 255 characters Default value is same as Public_Community
Application	This parameter should always be set to "custom"	Custom, **-**
SNMP_Protocol_Version*	Specify the SNMP protocol version supported by the Server	V2c, **V1**

Example

```
// Client Side Connections

Connections
Adapter     , Protocol     , Application   , SNMP_Protocol_Version
N1          , SNMP-STD     , custom        , v2c
```

4.3 Client Side Node Parameters

Section Title		
Nodes		
Column Title	**Function**	**Legal Values**
Node_Name	Provide name for Node	Up to 32 alphanumeric characters
Adapter	Adapter Name	N1, N2[2]
Protocol	Specify protocol used	SNMP-STD
IP_Address	Specify the Server Node's IP Address (Snmp Agent)	IP Address in decimal format

[1] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.
[2] 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        , Adapter    , Protocol    , IP_Address
Agent 1          , N1         , SNMP-STD    , 192.168.1.17
```

4.4 Client Side Map Descriptor Parameters

4.4.1 FieldServer Related 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 the Data Array to monitor for change	One of the Data Array names from section 4.1
Data_Array_Offset	Starting location in Data Array	0 to (Data_Array_Length-1) as specified in Section 5.1
Function	Function of Map Descriptor	Server, Rdbc, Wrbc, Wrbx

4.4.2 Driver Specific Map Descriptor Parameters

Section Title
Map Descriptors

Column Title	Function	Legal Values
Node_Name	Name of the Remote Server Node to be polled.	One of the Node names specified in section 4.3
Length	Length of Map Descriptor	1 – (Data Array length – Data Array Offset)
Parent_Map_Descriptor*	Specify the name of the parent Map Descriptor that holds the previous OID integer.	Name of the previously created Map Descriptor, -
SNMP_OID*	Specify the Object Identifier. It could be the child number to the parent or the full OID.	0 to any Integer or dot separated full OID, -
Data_Type	Specify the data type of the point in the MIB file	OCTET STRING, INTEGER, Integer32, Counter, Counter32, Counter64, Gauge, Gauge32, Unsigned32, BITS, INDEX, INDEX_INTEGER, Table, TableEntry
SNMP_Read_Method*	Specify the command that should be used to read data from Server	**Get**, Walk, BulkWalk

4.4.3 Simple Get/Set Map Descriptors Example

The following Map Descriptor will read the object identified by full OID 1.3.6.1.4.6347.1.1.3 every second and will store the data at offset 2 in DA_ScalarVar Data Array.

If the same Data Array location will be updated by another protocol, the FieldServer will issue a "Set" command to the SNMP server.

```
//  Client Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name     , Data_Array_Name   , Data_Array_Offset   , Function   , Node_Name     , Length   , SNMP_OID              , Data_Type   , Scan_Interval
Readn1ScalarObj3Name    , DA_SCALARVAR      , 2                   , rdbc       , SNMP_Server   , 1        , 1.3.6.1.4.1.6347.1.1.3 , Integer32   , 1.000s
```

4.4.4 Walk or BulkWalk Map Descriptors Example

Using "Walk" or "BulkWalk" FieldServer can read all the objects under a specified OID.

Data returned by each poll will be stored on passive Map Descriptors. Passive Map Descriptors should be created to build an OID tree structure from the Server's MIB file using the instructions under sections 5.5.3, 5.5.4, 5.5.5 and 5.5.6

```
//  Client Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name     , Data_Array_Name   , Data_Array_Offset   , Function   , Node_Name     , Length   , SNMP_OID   , Scan_Interval   , Snmp_Read_Method
ReadEverything          , DA_POLLER         , 0                   , rdbc       , SNMP_Server   , 50       , All        , 5.000s          , BulkWalk
```

If it is a BulkWalk request, the driver will request the next 50 objects to be sent by the Server. If it is a simple walk request, this parameter will get ignored and the Server will only send 1 next object.

OID to start with. "All" means the root of the OID tree i.e. 1.3. It could also be any OID, the driver will read the whole tree under this OID

Read method should be BulkWalk or Walk. BulkWalk is the most efficient way to read the whole tree.

5 CONFIGURING THE FIELDSERVER AS A SNMP SERVER/AGENT

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

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a SNMP Client such as a Network Management application. Please refer to Appendix A for a discussion of how to configure SNMP TRAPS.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for SNMP communications, the driver independent FieldServer buffers need to be declared in the "Data Arrays" section, the FieldServer virtual Node(s) needs to be declared in the "Server Side Nodes" section, and the data to be provided to the Client needs to be mapped in the "Server 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.

5.1 Server Side Data Arrays

Data Arrays are "protocol neutral" data buffers for storage of data to be passed between protocols. It is necessary to declare the data format of each of the Data Arrays to facilitate correct storage of the relevant data.

Section Title		
Data_Arrays		
Column Title	Function	Legal Values
Data_Array_Name	Provide name for Data Array	Up to 15 alphanumeric characters
Data_Array_Format	Provide data format. Each Data Array can only take on one format.	Float, Bit, Uint16, Sint16, Uint32, Sint32, Byte.
Data_Array_Length	Number of Data Objects. Must be larger than the data storage area required by the Map Descriptors for the data being placed in this array.	1-10, 000

5.1.1 Standard Configuration

A special Data Array naming convention is used to map FieldServer Data Arrays into the SNMP OID addressing scheme. Any Data Arrays that are to be visible via SNMP have to be named in the following way:

```
Data_Arrays
Data_Array_Name     Data_Format    Data_Array_Length
// Scalar Data Arrays
SNMP_AI             , AI           , 21
SNMP_AO             , AO           , 21
SNMP_AV             , AV           , 21
SNMP_BI             , BI           , 21
SNMP_BO             , BO           , 21
SNMP_BV             , BV           , 21
//Vector Data Arrays
SNMP_SV_1           , BV           , 21
SNMP_AV_1           , AV           , 21
SNMP_BV_1           , BV           , 21
SNMP_SV_2           , BV           , 21
SNMP_AV_2           , AV           , 21
SNMP_BV_2           , BV           , 21
```

A Scalar data array should be used to represent data of the same type (e.g.: Analog values) in a single logical SNMP block. Vector data arrays should be used only if it is required to see data of the same type in multiple logical SNMP blocks. For example suppose the FieldServer has to represent data (1000 Analog values in this example) from multiple sources (ID's 10 and 11 in this example)
To do this one would declare vector Data Arrays SNMP_AV_10 & SNMP_AV_11, where 10 and 11 are identifiers (vector numbers) to represent source ID's.
SNMP OIDs for vector data arrays (assuming 500 in each array) will be:
1.3.6.1.4.1.6347.2.52.1.1.10.1 - 1.3.6.1.4.1.6347.2.52.1.1.10.500
and
1.3.6.1.4.1.6347.2.52.1.1.11.1 - 1.3.6.1.4.1.6347.2.52.1.1.11.500

If one Scalar Array (SNMP_AV) had been used instead, the OID's would simply have been:
1.3.6.1.4.1.6347.2.4.1.1.1 - 1.3.6.1.4.1.6347.2.4.1.1.1000

The Data_Format[3] and Data_Array_Length may be freely chosen. The Scalar Data Array needs to be determined as specified in the example above. The Vector Data Array name must be in SNMP_xV_y format, where x is the vector type (S-String, A-Analog, B-Binary) and y is the Integer number representing the vector number. Data will be mapped from Data Array Offset 1, e.g. OID 1 will be mapped to the specified Data Array at Offset 1, OID 3 will be mapped at Offset 3.

FieldServer OID's are based upon the Data Array name and length. The following table shows OID ranges for the Data Arrays declared in the previous table.

Scalar Data_Array_Name, Data_Format, Data_Array_Length	**Value OID range**	**Description OID range**
SNMP_AI, AI, 21	1.3.6.1.4.1.6347.2.2.1.1.1- 1.3.6.1.4.1.6347.2.2.1.1.20	1.3.6.1.4.1.6347.2.2.1.2.1- 1.3.6.1.4.1.6347.2.2.1.2.20
SNMP_AO, AO, 21	1.3.6.1.4.1.6347.2.3.1.1.1- 1.3.6.1.4.1.6347.2.3.1.1.20	1.3.6.1.4.1.6347.2.3.1.2.1- 1.3.6.1.4.1.6347.2.3.1.2.20
SNMP_AV, AV, 21	1.3.6.1.4.1.6347.2.4.1.1.1- 1.3.6.1.4.1.6347.2.4.1.1.20	1.3.6.1.4.1.6347.2.4.1.2.1- 1.3.6.1.4.1.6347.2.4.1.2.20
SNMP_BI, BI, 21	1.3.6.1.4.1.6347.2.5.1.1.1- 1.3.6.1.4.1.6347.2.5.1.1.20	1.3.6.1.4.1.6347.2.5.1.2.1- 1.3.6.1.4.1.6347.2.5.1.2.20
SNMP_BO, BO, 21	1.3.6.1.4.1.6347.2.6.1.1.1- 1.3.6.1.4.1.6347.2.6.1.1.20	1.3.6.1.4.1.6347.2.6.1.2.1- 1.3.6.1.4.1.6347.2.6.1.2.20
SNMP_BV, BV, 21	1.3.6.1.4.1.6347.2.7.1.1.1- 1.3.6.1.4.1.6347.2.7.1.1.20	1.3.6.1.4.1.6347.2.7.1.2.1- 1.3.6.1.4.1.6347.2.7.1.2.20

Vector Data_Array_Name, Data_Format, Data_Array_Length	**Value OID range**	**Vector Description OID**
SNMP_SV_1, BV , 21	1.3.6.1.4.1.6347.2.51.1.1.1.1- 1.3.6.1.4.1.6347.2.51.1.1.1.20	1.3.6.1.4.1.6347.2.51.1.2.1
SNMP_SV_2 , BV, 21	1.3.6.1.4.1.6347.2.51.1.1.2.1- 1.3.6.1.4.1.6347.2.51.1.1.2.20	1.3.6.1.4.1.6347.2.51.1.2.2
SNMP_SV_x , BV , y	1.3.6.1.4.1.6347.2.51.1.1.x.1- 1.3.6.1.4.1.6347.2.51.1.1.x.(y-1)	1.3.6.1.4.1.6347.2.51.1.2.x
SNMP_AV_1, AV, 21	1.3.6.1.4.1.6347.2.52.1.1.1.1- 1.3.6.1.4.1.6347.2.52.1.1.1.20	1.3.6.1.4.1.6347.2.52.1.2.1.1 - 1.3.6.1.4.1.6347.2.52.1.2.1.20

[3] Please Note that the SNMP driver server transfers all data array values to requesting clients as signed integers or SInt32, except for ascii characters which exchange in strings. The Data_Format for data arrays may still be freely chosen but be aware that value truncation and a change of sign of driver displayed values may take place when these values are transferred to the client.

SNMP_AV_2, AV, 21	1.3.6.1.4.1.6347.2.52.1.1.2.1- 1.3.6.1.4.1.6347.2.52.1.1.2.20	1.3.6.1.4.1.6347.2.52.1.2.2.1- 1.3.6.1.4.1.6347.2.52.1.2.2.20
SNMP_AV_x, AV, y	1.3.6.1.4.1.6347.2.52.1.1.x.1- 1.3.6.1.4.1.6347.2.52.1.1.x.(y-1)	1.3.6.1.4.1.6347.2.52.1.2.x.1- 1.3.6.1.4.1.6347.2.52.1.2.x.(y-1)
SNMP_BV_1, BV, 21	1.3.6.1.4.1.6347.2.53.1.1.1.1- 1.3.6.1.4.1.6347.2.53.1.1.1.20	1.3.6.1.4.1.6347.2.53.1.2.1.1- 1.3.6.1.4.1.6347.2.53.1.2.1.20
SNMP_BV_2, BV, 21	1.3.6.1.4.1.6347.2.53.1.1.2.1- 1.3.6.1.4.1.6347.2.53.1.1.2.20	1.3.6.1.4.1.6347.2.53.1.2.2.1- 1.3.6.1.4.1.6347.2.53.1.2.2.20-
SNMP_BV_x, BV, y	1.3.6.1.4.1.6347.2.53.1.1.x.1- 1.3.6.1.4.1.6347.2.53.1.1.x.(y-1)	1.3.6.1.4.1.6347.2.53.1.2.x.1- 1.3.6.1.4.1.6347.2.53.1.2.x.(y-1)

5.1.2 Custom Configuration

There is no special Data Array naming convention or format instructions.

```
Data_Arrays
Data_Array_Name    , Data_Format    , Data_Array_Length
G_ALM_STAT_1       , Uint16         , 7
G_ALM_CNTR_1       , Uint16         , 6
BRN_CUR_ALM_1      , Uint16         , 253
LOCATION_1         , Byte           , 128
AUX_CNT64_         , Uint32         , 2
DA_CONFIG          , Bit            , 1
```

5.2 Server Side Connection Descriptors

Section Title		
Connections		
Column Title	**Function**	**Legal Values**
Adapter	Adapter Name	N1, N2[4]
Protocol	Specify protocol used	SNMP-STD
Public_Community* (Also known as SNMP_Community)	Specify the public community name. Any device accessing the FieldServer with this community name will have read-only privileges. This is a case sensitive parameter. If community in poll is not the same as public or private, poll will be discarded.	Any string up to 255 characters, **Public**
Private_Community*	Specify the private community name if it differs from the public_community. Any device accessing the FieldServer with this community name will have read-write privileges. This is a case sensitive parameter.	Any string up to 255 characters **Public**
Trap_Community*	Specify the trap community name if it differs from the public_community. This community name will be used in traps/informs generated by FieldServer. This is a case sensitive parameter.	Any string up to 255 characters. **Public**

Example

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

```
// Server Side Connections

Connections
Adapter      , Protocol     , Application   , SNMP_Protocol_Version
N1           , SNMP-STD     , custom        , v2c
```

5.3 Server Side Node Descriptors (Required only if sending Traps, or for custom configuration)

Section Title
Remote_Client_Node_Descriptors

Column Title	**Function**	**Legal Values**
Node_Name	Provide name for Node	Up to 32 alphanumeric characters
Adapter	Adapter Name	N1, N2[5]
Protocol	Specify protocol used	SNMP-STD
IP_Address	Specify the Client Node's IP Address (Receiver of Traps)	IP Address in decimal format

Example

```
// Server Side Nodes

Remote_Client_Node_Descriptors
Node_Name                  , Adapter     , Protocol     , IP_Address
Agent 1                    , N1          , SNMP-STD     , 192.168.1.17
```

5.4 Standard Server Side Map Descriptors (Required only if sending Traps)

Server Side Map Descriptors are not required by SNMP for Get, Get_Next or Set requests, since the mapping of FieldServer Data Arrays into the SNMP OID addressing scheme follows the method outlined in Section 5.1. Server Side Map Descriptors are required to configure SNMP TRAPS only.

5.4.1 FieldServer Related 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 to monitor for change	One of the Data Array names from "Data Array" section above
Data_Array_Offset	Starting location in Data Array	0 to (Data_Array_Length-1) as specified in Section 5.1
Function	Function of Client Map Descriptor	SNMP_TRAP

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

5.4.2 Driver Specific Map Descriptor Parameters

Section Title
Map Descriptors

Column Title	Function	Legal Values
Node_Name	Name of the Remote Client Node to which Trap will be sent.	One of the Node names specified in "Server Node Descriptor" above
Length	Length of Map Descriptor	1 – (Data Array length – Data Array Offset)
Trap_Type*	Specify the trap type that will be encoded in the Trap message whenever point is in Off-Normal state. Trap type Normal will be encoded in the trap message while the point is in normal state.	Trap_Type Encode value **Alarm** 6 High Alarm 7 Low Alarm 8 Normal 9 Fault 10 Trouble 10 Error 11 Warning 12 Cov 13
Cov_Normal*	This is applicable to Digital points only. Specify the normal value for digital point. When the value changes to or from Normal, a Trap will be sent.	**0** , 1
Cov_Hi_Alm*	Specify High Alarm threshold	**0.0**, Any float/integer value
Cov_Hi_Warn*	Specify High Warning threshold	**0.0**, Any float/integer value
Cov_Lo_Warn*	Specify Low Warning threshold	**0.0**, Any float/integer value
Cov_Lo_Alm*	Specify Low Alarm threshold	**0.0**, Any float/integer value
Cov_Deadband*	Specify the deadband value which must be exceeded for Alarm or Warning states to toggle (prevents chatter). A Trap will be sent only if the value change exceeds the deadband or the state changes.	**0.0**, Any float/integer value

5.4.3 Binary Trap Map Descriptor Example

The following Map Descriptors will generate a Trap whenever value/state changes from/to normal.

```
//  Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name   , Data_Array_Name   , Data_Array_Offset   , Function     , Trap_Type   , Node_Name   , Length   , Cov_Normal
Trap_Range_BI         , SNMP_BI           , 3                   , SNMP_Trap    , Alarm       , Mngr_1      , 2        , 0
Trap_Range_BIb        , SNMP_BI           , 5                   , SNMP_Trap    , Alarm       , Mngr_1      , 1        , 1
```

Trap of type Alarm(6) will be generated.

A Trap of type Alarm (6) will be generated when the value changes from the specified COV_Normal value, and a Trap of Type Normal (9) will be generated when the value returns to the specified value.

5.4.4 Analog Trap Map Descriptor Example

The following Map Descriptor will generate a Trap whenever a value changes by the deadband(5) or the point's status changes (Normal, Warning, Alarm)

```
//  Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name   ,Data_Array_Name   ,Data_Array_Offset   ,Function     ,Trap_Type   ,Node_Name   ,Length   ,Cov_Deadband   ,Cov_Hi_Warn   ,Cov_Hi_Alm
Trap_Range_AI2        , SNMP_AI          , 2                  ,SNMP_Trap    , Alarm      , Mngr_1      , 1        , 5              , 50           , 100
```

5.5 Custom Server Side Map Descriptors

5.5.1 FieldServer Related 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 to monitor for change	One of the Data Array names from "Data Array" section above
Data_Array_Offset	Starting location in Data Array	0 to (Data_Array_Length-1) as specified in Section 5.1
Function	Function of Map Descriptor	Server, SNMP_TRAP

5.5.2 Driver Specific Map Descriptor Parameters

Section Title
Map Descriptors

Column Title	Function	Legal Values
Node_Name	Name of the Remote Client Node to which Trap will be sent.	One of the Node names specified in "Server Node Descriptor" above
Length	Length of Map Descriptor	1 – (Data Array length – Data Array Offset)
SNMP_OID	Specify the Object Identifier. One Map Descriptor is required for each OID specified as an integer.	0 to any Integer
Parent_Map_Descriptor*	Specify the name of the parent Map Descriptor that holds the previous OID integer.	Name of the previously created Map Descriptor, **-**
Data_Type	Specify the data type of the point in the MIB file	OCTET STRING, INTEGER, Integer32, Counter, Counter32, Counter64, Gauge, Gauge32, Unsigned32, BITS, INDEX, INDEX_INTEGER, Table, TableEntry, Trap, TrapVar
SNMP_TRAP_MD	Specify the name of the TrapVar Map Descriptor to which this trap Map Descriptor is linked.	One of the Map Descriptors with data type set to TrapVar configured previously.
Inform_Request*	Specify if this is an Inform Request or not. Inform Requests are traps required to be acknowledged.	Yes, **No**

5.5.3 Basic OID Structure Map Descriptors Example

For the following MIB file structure,

```
verisIndustries  OBJECT IDENTIFIER ::= { enterprises 40845 }  --  1.3.6.1.4.1.40845 Veris Private Enterprise Number
    verisEnergy      OBJECT IDENTIFIER ::= { verisIndustries 1 }  --  1.3.6.1.4.1.40845.1
        bcpmE30          OBJECT IDENTIFIER ::= { verisEnergy 30 }  --  1.3.6.1.4.1.40845.1.30
            panels           OBJECT IDENTIFIER ::= { bcpmE30 1 }  --  1.3.6.1.4.1.40845.1.30.1
                panel1           OBJECT IDENTIFIER ::= { panels 1 }  --  1.3.6.1.4.1.40845.1.30.1.1
                    p1Alarms          OBJECT IDENTIFIER ::= { panel1 1 }  --  1.3.6.1.4.1.40845.1.30.1.1.1
                    p1VoltageInputs   OBJECT IDENTIFIER ::= { panel1 2 }  --  1.3.6.1.4.1.40845.1.30.1.1.2
                    p1AuxiliaryInputs OBJECT IDENTIFIER ::= { panel1 3 }  --  1.3.6.1.4.1.40845.1.30.1.1.3
```

the support for iso.org.dod.internet.private.(1.3.6.1.) OID is built-in. The customized configuration is shown below:

```
//  Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name   , Data_Array_Name , Data_Array_Offset , Function , Node_Name , Length , Snmp_OID , Parent_Map_Descriptor , Data_Type
private               , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 4        , -                     , -
enterprise            , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 1        , private               , -
verisIndustries       , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 40845    , enterprise            , -
verisEnergy           , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 1        , verisIndustries       , -
bcpmE30               , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 30       , verisEnergy           , -
Panels                , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 1        , bcpmE30               , -
Panel1                , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 1        , panels                , -
p1Alarms              , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 1        , panel1                , -
p1VoltageInputs       , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 2        , panel1                , -
P1AuxilaryInputs      , DA_CONFIG       , 0                 , Server   , Agent1    , 1      , 3        , panel1                , -
```

5.5.4 Simple object Map Descriptor Example

The following section of an MIB file shows simple child (i.e. last in tree) OIDs of p1Alarms:

```
    p1GlobalAlarmStatus OBJECT IDENTIFIER ::= { p1Alarms 1 }
        p1TotalLatchingChannelsInAlarm OBJECT-TYPE
            SYNTAX              Unsigned32
            MAX-ACCESS          read-only
            STATUS              current
            DESCRIPTION         "Total Number of Aux and Branch Channels in Latching Alarm"
            ::= { p1GlobalAlarmStatus 5 }

        p1TotalNonLatchingChannelsInAlarm OBJECT-TYPE
            SYNTAX              Unsigned32
            MAX-ACCESS          read-only
            STATUS              current
            DESCRIPTION         "Total Number of Aux and Branch Channels in Non-Latching Alarm"
            ::= { p1GlobalAlarmStatus 6 }
```

The following three Map Descriptors must be defined for this section of the MIB file:

```
//   Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name               , Data_Array_Name   , Data_Array_Offset  , Function  , Node_Name  , Length  , Snmp_OID  , Parent_Map_Descriptor          , Data_Type
p1GlobalAlarmStatus               , DA_CONFIG         , 0                 , Server    , Agent1     , 1         , 1         , p1Alarms                      , -
p1TotalLatchingChannelsInAlarm    , G_ALM_STAT_1      , 4                 , Server    , Agent1     , 1         , 5         ,p1GlobalAlarmStatus            , Unsigned32
P1TotalNonLatchingChannelsInAlarm , G_ALM_STAT_1      , 5                 , Server    , Agent1     , 1         , 6         , p1TotalLatchingChannelsInAlarm , Unsinged32
```

5.5.5 Table, TableEntry and objects in TableEntry Map Descriptor Example

The following section for an MIB file shows a table of p1Alarms:

```
p1AuxVoltageAndCurrentAlarmTable OBJECT-TYPE
        SYNTAX              SEQUENCE OF P1AuxVoltageAndCurrentAlarmTableEntry
        MAX-ACCESS          not-accessible
        STATUS              current
        DESCRIPTION         "Individual Auxiliary Phase Alarms: Index 1, 2, 3, 4 = Phase A, B, C, N"
        ::= { p1Alarms 3 }
```

The following Map Descriptor implements the table:

```
//   Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name              , Data_Array_Name   , Data_Array_Offset   , Function   , Node_Name   , Length   , Snmp_OID   , Parent_Map_Descriptor   , Data_Type
p1AuxVoltageAndCurrentAlarmTable , DA_CONFIG         , 0                  , Server     , Agent1      , 1        , 3           , p1Alarms                 , Table
```

The following section in the MIB file shows a table entry:

```
p1AuxVoltageAndCurrentAlarmTableEntry  OBJECT-TYPE
            SYNTAX              P1AuxVoltageAndCurrentAlarmTableEntry
            MAX-ACCESS          not-accessible
            STATUS              current
            DESCRIPTION         "Individual Auxiliary Phase Alarms: Index 1, 2, 3, 4 = Phase A, B, C, N"
            INDEX               {
                                    p1AuxAlarmIndex
                                }
            ::= { p1AuxVoltageAndCurrentAlarmTable 1 }
```

The following Map Descriptor implements the table entry:

```
//   Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name                  , Data_Array_Name  , Data_Array_Offset  , Function  , Node_Name  , Length  , Snmp_OID  , Parent_Map_Descriptor              , Data_Type
p1AuxVoltageAndCurrentAlarmTableEntry , DA_CONFIG        , 0                 , Server    , Agent1      , 1        , 1           , p1AuxVoltageAndCurrentAlarmTable , TableEntry
```

The following section in the MIB file shows a table entry that doesn't need a defined Map Descriptor:

```
P1AuxVoltageAndCurrentAlarmTableEntry ::= SEQUENCE {
            p1AuxAlarmIndex  -- index 1, 2, 3, 4 = phase A, B, C, N
                Unsigned32,
            p1AuxAlarmPhase  -- index 1, 2, 3, 4 = phase A, B, C, N
                Unsigned32,
            p1VoltagePhaseAlarmStatus -- [241-243]   voltage alarms
                BITS,
            p1AuxCurrentAlarmStatus -- [220-223]  current alarms
                BITS,
            p1AuxHighHighAlarmCount -- [343-346]
                Counter32,
            p1AuxHighAlarmCount -- [389-392]
                Counter32,
            p1AuxLowAlarmCount -- [435-438]
                Counter32,
            p1AuxLowLowAlarmCount -- [481-484]
                Counter32,
            p1AuxOffStateAlarmCount -- [527-530]
                Counter32
```

For the following example each entry in tableEntry has been defined as an individual object and needs a Map Descriptor for each object:

```
        p1AuxAlarmIndex OBJECT-TYPE    --  index 1, 2, 3, 4 = phase A, B, C, N
            SYNTAX              Unsigned32 (1..4)
            MAX-ACCESS          not-accessible
            STATUS              current
            DESCRIPTION         "Auxiliary Phase Number Index: 1, 2, 3, 4 = phase A, B, C, N"
            ::= { p1AuxVoltageAndCurrentAlarmTableEntry 1 }

        p1AuxAlarmPhase OBJECT-TYPE    --  index 1, 2, 3, 4 = phase A, B, C, N (same as Index, but readable)
            SYNTAX              Unsigned32 (1..4)
            MAX-ACCESS          read-only
            STATUS              current
            DESCRIPTION         "Auxiliary Phase Number Index: 1, 2, 3, 4 = phase A, B, C, N"
            ::= { p1AuxVoltageAndCurrentAlarmTableEntry 2 }
```

The following two Map Descriptors are defined by index in the table but have different names and might not be connected to any real time data. In some MIB files there could be only single index entry. Correspondingly Map descriptors will be as follows:

```
//   Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name    , Data_Array_Name  , Data_Array_Offset  , Function  , Node_Name  , Length  , Snmp_OID  , Parent_Map_Descriptor                    , Data_Type
p1AuxAlarmIndex        , DA_CONFIG        , 0                  , Server    , Agent1     , 4       , 1         , p1AuxVoltageAndCurrentAlarmTableEntry  , INDEX
p1AuxAlarmPhase        , DA_CONFIG        , 0                  , Server    , Agent1     , 4       , 2         , p1AuxVoltageAndCurrentAlarmTableEntry  , INDEX
```

Other objects defined in a table entry might be simple objects.

Looking at the last two objects from tableEntry as an example:

```
p1AuxLowLowAlarmCount OBJECT-TYPE    --  [481-484]
            SYNTAX              Counter32
            MAX-ACCESS          read-only
            STATUS              current
            DESCRIPTION         "Count of Auxiliary Current Low Low Alarms"
            ::= { p1AuxVoltageAndCurrentAlarmTableEntry 8 }

        p1AuxOffStateAlarmCount OBJECT-TYPE    --  [527-530]
            SYNTAX              Counter32
            MAX-ACCESS          read-only
            STATUS              current
            DESCRIPTION         "Count of Auxiliary Current Alarm Off State Transitions"
            ::= { p1AuxVoltageAndCurrentAlarmTableEntry 9 }
```

Corresponding Map Descriptors will be as follows:

```
//   Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name      , Data_Array_Name  , Data_Array_Offset  , Function  , Node_Name  , Length  , Snmp_OID  , Parent_Map_Descriptor                    , Data_Type
p1AuxLowLowAlarmCount    , AUX_VC_ALM_1     , 21                 , Server    , Agent1     , 4       , 8         , p1AuxVoltageAndCurrentAlarmTableEntry  , Counter32
p1AuxOffStateAlarmCount  , AUX_VC_ALM_1     , 25                 , Server    , Agent1     , 4       , 9         , p1AuxVoltageAndCurrentAlarmTableEntry  , Counter32
```

5.5.6 String Object Map Descriptor Example

The MIB file below shows a string object entry:

```
p1LocationString   OBJECT-TYPE    -- [7-70]
    SYNTAX              DisplayString (SIZE(128))
    MAX-ACCESS          read-write
    STATUS              current
    DESCRIPTION         "Null terminated Text String Describing Physical Installation"
    ::= { p1ProductInformation 5 }
```

The corresponding Map Descriptor will be as follows. Note parent map descriptor p1ProductInformation should be defined before this Map Descriptor.

Although the Map Descriptor length is 128, the driver will only serve characters until the null character in the LOCATION_1 Data Array. The null character will not be included in the response string.

```
//  Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name     , Data_Array_Name   , Data_Array_Offset   , Function   , Node_Name   , Length   , Snmp_OID   , Parent_Map_Descriptor     , Data_Type
p1LocationString        , LOCATION_1        , 0                  , Server     , Agent1      , 128      , 5          , p1ProductInformation      , DisplayString
```

5.5.7 Trap/Notification Map Descriptor Example

The MIB file below shows the definition of a trap:

```
p1Traps OBJECT IDENTIFIER ::= { p1Alarms 0 }
```

The corresponding Map Descriptor will be:

```
//  Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name   , Data_Array_Name   , Data_Array_Offset   , Function   , Node_Name   , Length   , Snmp_OID   , Parent_Map_Descriptor     , Data_Type
p1Traps               , DA_CONFIG         , 0                  , Server     , Agent1      , 1        , 0          , p1Alarms                  ,TRAP
```

A next entry in the MIB file declares the trap to include p1AuxAlarmPhase and p1VoltagePhaseStatus as trap variables:

```
p1VoltagePhaseAlarmStatusTrap NOTIFICATION-TYPE    -- [241-243]   voltage alarms A, B, C. Return phase index &
status register.
            OBJECTS
            {
                p1AuxAlarmPhase,
                p1VoltagePhaseAlarmStatus
            }
            STATUS              current
            DESCRIPTION         "Voltage Alarm Status Bit Map: 0 HighLatching, 1 LowLatching, 8 HighNonLatching"
            ::= { p1Traps 3 }
```

The corresponding Map Descriptors will be as follows:

```
//   Server Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name            , Data_Array_Name   , Data_Array_Offset   , Function   , Node_Name   , Length   , Snmp_OID   , Parent_Map_Descriptor          , Data_Type
p1VoltagePhaseAlarmStatusTrap  , DA_CONFIG         , 0                   , Server     , Agent1      , 1        , 3          , p1Traps                         , TRAP
p1AuxAlarmIndex                , AUX_VC_ALM_1      , 0                   ,Server      , Agent1      , 1        , 1          , VoltagePhaseAlarmStatusTrap     , TrapVar
p1VoltagePhaseAlarmStatus      , AUX_VC_ALM_1      , 1                   , Server     , Agent1      , 4        , 2          , VoltagePhaseAlarmStatusTrap     , TrapVar
```

Once the trap and trap variable Map Descriptors have been defined, a Map Descriptor is needed to trigger the trap.

The following Map Descriptor will trigger the trap whenever any value changes in Data Array AUX_VC_ALM_1 offset 1 thru 4.

This Map Descriptor will trigger p1VoltagePhaseAlarmStatusTrap that has been defined above and it will include two variables in the trap.

```
Map_Descriptors
Map_Descriptor_Name          , Data_Array_Name   , Data_Array_Offset   , Function     , Node_Name   , Length   , SNMP_Trap_MD
p1VoltagePhaseAlarmStatus    , AUX_VC_ALM_1      , 1                   , Snmp_Trap    , Agent1      , 4        , p1VoltagePhaseAlarmStatusTrap
```

Appendix A. USEFUL FEATURES

Appendix A.1. Contents of Trap Messages

Each Trap has a Specific-Trap and 4 OIDs for four bound variables (the payload). Systems that use traps are typically set up to watch for OID's in the payloads. The Specific-Trap is set according to the Map Descriptor's Trap_Type parameter.

The four bound variables are as specified in standard MIB file as

VARIABLES {notificationPointType, notificationPointIndex, notificationPointDescription, notificationPointValue}

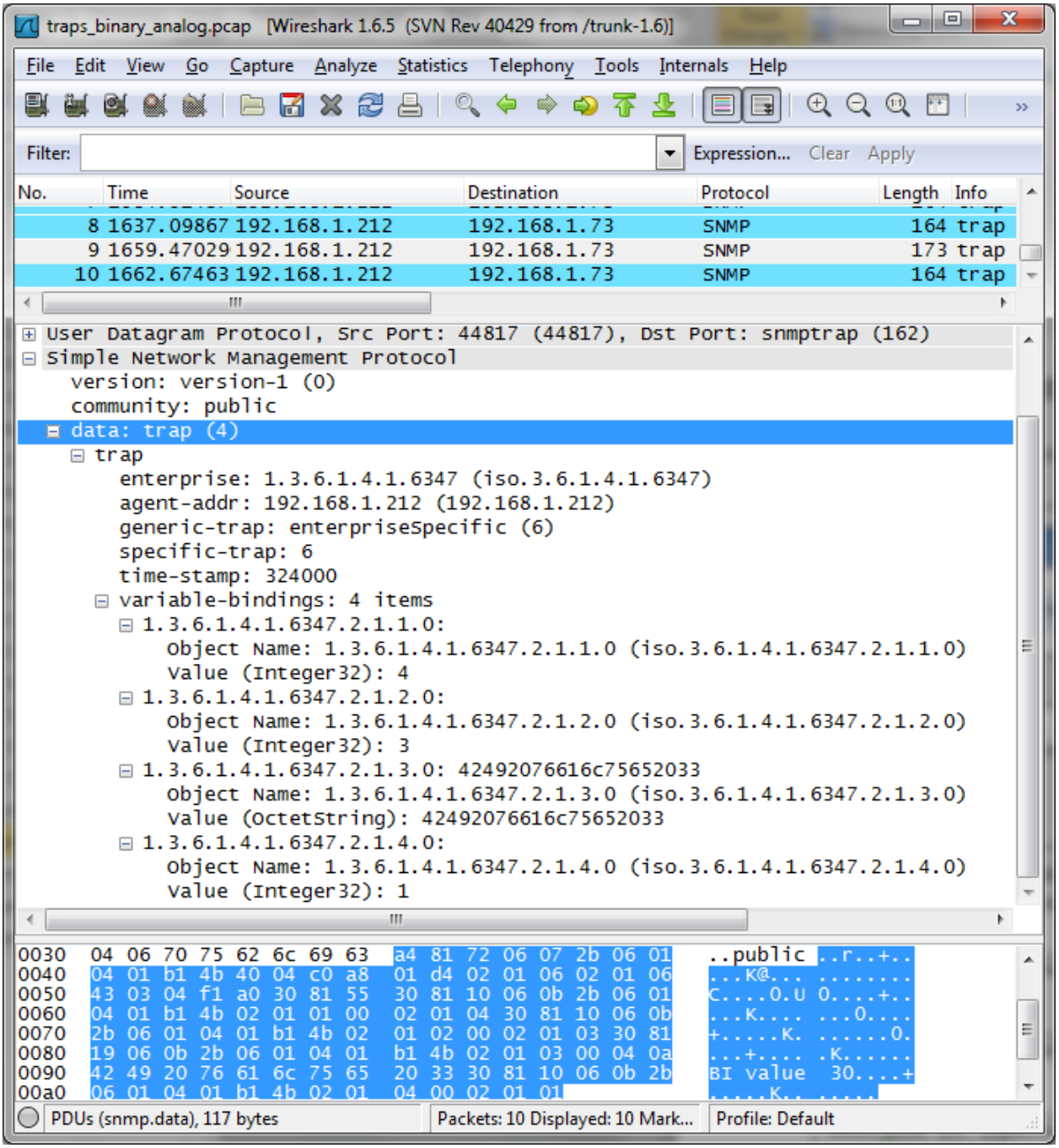
Variable	OID
notificationPointType OBJECT-TYPE SYNTAX INTEGER (analogInput(1), analogOutput(2), analogValue(3), binaryInput(4), binaryOutput(5), binaryValue(6) } ACCESS read-only STATUS current DESCRIPTION "Identifies the Point Type in a Notification." ::= {notificationFields 1 }	1.3.6.1.4.6347.2.1.1.0 ,
notificationPointIndex OBJECT-TYPE SYNTAX INTEGER ACCESS read-only STATUS current DESCRIPTION "Identifies the Point Index in a Notification." ::= {notificationFields 2 }	1.3.6.1.4.6347.2.1.2.0 ,
notificationPointDescription OBJECT-TYPE SYNTAX OCTET STRING ACCESS read-only STATUS current DESCRIPTION "Description of the Point in a Notification." ::= {notificationFields 3 }	1.3.6.1.4.6347.2.1.3.0 ,
notificationPointValue OBJECT-TYPE SYNTAX INTEGER ACCESS read-only STATUS current DESCRIPTION "Value of the Point in a Notification." ::= {notificationFields 4 }	1.3.6.1.4.6347.2.1.4.0 ,

Appendix A.1.1. Trap Example

This Trap was sent for Binary Input 3 (named as "BI value 3") when the value changed to 1. The Specific Trap for this Trap is 6 which is "Alarm" The OID's for the 4 bound variables are as follows:

OID	Format	Value	Description
1.3.6.1.4.1.6347.2.1.1.0	Integer	4	Type object (4=Binary Input)
1.3.6.1.4.1.6347.2.1.2.0	Integer	3	Object number
1.3.6.1.4.1.6347.2.1.3.0	OctetString	BI value 3	Object name preloaded in config file
1.3.6.1.4.1.6347.2.1.4.0	Integer	1	Current Object value

The following snapshot shows this Trap in Wireshark capture:



Appendix A.2. Using an .ini file to set the Enterprise_ID and Enterprise_Name

The vendor.ini file can be used to change the snmp_enterprise_id and snmp_enterprise_name if desired. A file with the following format must be created and downloaded to the FieldServer:

snmp_enterprise_id = 6347
snmp_enterprise_name = FieldServertechnologies

Note* when using vendor.ini, also update FServer.mib file. Replace all instances of FieldServertechnologies with new enterprise name and id 6347 to new id.

Appendix A.3. Preloading point descriptions

The following example shows how to preload description strings for SNMP points:

```
Preloads
Data_Array_Name    , Preload_Data_Index    , Preload_Data_Format    , Preload_Object_Name
// Analog Input/Output/value description
SNMP_AI            , 3                     , String                 , AI value 3 Desc
SNMP_AO            , 4                     , String                 , AO value 4 Desc
SNMP_AV            , 5                     , String                 , AV value 5 Desc
// Analog vector1 description
SNMP_AV_1          , 3                     , String                 , AVector1 val3 Desc
SNMP_AV_1          , 5                     , String                 , AVector1 val5 Desc
```

Appendix B. REFERENCE

Appendix B.1. Driver Error Messages

Error #	Msg Screen	Screen message	Meaning	Suggested Solution
SNMP-STD#01	ERROR	SNMP-STD#01: Bad Node_ID - forcing to 1	Node_ID is not in range 1-255. Driver defaulting it to 1.	Update configuration file to assign unique Node_ID in range 1-255. Node_ID's are used when Node_Status bits are prepared. Refer to Enote43 on the FST Web Site.
SNMP-STD#02	DRIVER	SNMP-STD#02 : Could not read SNMP response version	The driver found an error in the message structure preventing it from extracting the SNMP version number.	If this message is received rarely and data is being transferred correctly then ignore it. If it is repeated or affects data transfer then take a log and call tech Support. This message is usually preceded by a message which provides more specific information as to why the parse failed.
SNMP-STD#03	DRIVER	SNMP-STD#03 : Version. Expected=1 Rcvd=%d	This driver only supports SNMP version #1.	
SNMP-STD#4A	DRIVER	SNMP-STD#4A : Extract Int Failed. Index=%d	The driver is extracting an integer value from the SNMP message but the field was incorrectly formatted.	
SNMP-STD#4B	DRIVER	SNMP-STD#4B : Expected INT. Found NULL. Index=%d		
SNMP-STD#05	DRIVER	SNMP-STD#05 : Parse Failed. MD=%s	The driver is attempting to process a SNMP message that is not correctly formatted; contains an error or contains unsupported SNMP elements. Immediately after the message has been printed the driver does a hexadecimal dump of the message.	
SNMP-STD#06	DRIVER	SNMP-STD#06: Can't send to Agent/Trap Dest. %s at %s	The FieldServer cannot reach the specified remote Node. The message prints the Node name and the IP address. This message is most commonly printed when an incorrect IP address has been specified or when the remote Node is off or in an Error State.	Check the specified IP Address or remote device if it is healthy and connected to network.
SNMP-STD#07	DRIVER	SNMP-STD#07 : Invalid SNMP PDU type 0x%x	An unsupported PDU Type was received by the Server Supported PDU Types: GET/SET/GET-NEXT/TRAP	Refer to msg #05 for follow up actions.
SNMP-STD#08	DRIVER	SNMP-STD:#08 : Bad community string	The SNMP message contains a badly formatted community string or the community string is absent.	If this message occurs occasionally, ignore it. Otherwise take a log and call tech support.

Error #	Msg Screen	Screen message	Meaning	Suggested Solution
SNMP-STD#09	DRIVER	SNMP:#09 ERR. Couldn't respond to Get Request for OID:	The driver can only serve data for configured OID points.	Ignore this message if it occurs once per full walk test. If this message occurs frequently and for any other request either configure FieldServer or remote device.
SNMP-STD#10	DRIVER	SNMP-STD#10 : Store Int. DA=%s:%d value=%d gen=%d SNMP-STD#10: Store ! String DA=%s:%d value=%d	The driver is storing data.. The message indicates where the data was stored. It is intended as a debugging tool.	This message is for information only No Action required.
SNMP-STD#11	DRIVER	SNMP-STD#11: Unsupported data_type: 0x%x	The driver is storing data but the data type is not supported.	Check the Driver fact for supported Data Types and correct the configuration of the remote client/agent
SNMP-STD#12	DRIVER	SNMP-STD#12 : No SNMP-STD DA's configured.	SNMP-STD Data Arrays are missing. There won't be any communication between FieldServer and remote Client.	Declare the Data Arrays as described in Section 5.1
SNMP-STD#13	ERROR	DRV->SNMP-STD#13 : Standard Data Arrays must be of Complex Data Object type. Set Data_Format to AI, AO, AV, BI, BO or BV	The Data format of the SNMP Data Array is incorrect.	Set correct Data_Format as described in Section 5.1
SNMP-STD#14	DRIVER	SNMP-STD#14: Couldn't parse msg: found %#x at %d	The Server received a message containing an unsupported bound variable, e.g. OPAQUE, TRAP. The driver prints a hex dump of the offending message.	Ensure that the remote SNMP client is correctly configured. Capture a log and call tech Support.
SNMP-STD#15	DRIVER	SNMP-STD#15: Invalid Msg	The driver has received a message from a SNMP client which is not correctly formatted or which contains bound variables/features not supported by the driver. This particular error message is printed when the SNMP message does not begin with 0x30.	If this message is received rarely and data is being transferred correctly then ignore it. If it is repeated or affects data transfer then take a log and call tech Support. This message is usually preceded by a message which provides more specific information as to why the parse failed.
SNMP-STD#16	DRIVER	SNMP-ST#16: Message length error	The SNMP message indicates that a message length is different to the number of bytes received.	
SNMP-STD#17	DRIVER	SNMP-STD#17: Could not get Request ID	The SNMP message number is badly formatted or absent.	
SNMP-STD#18	DRIVER	SNMP-STD#18: Could not get Error Status	The SNMP error status field is badly formatted or absent.	
SNMP-STD#19	DRIVER	SNMP-STD#19: Could not get Error Index	The SNMP error id field is badly formatted or absent	

Error #	Msg Screen	Screen message	Meaning	Suggested Solution
SNMP-STD#20	DRIVER	SNMP-STD#20: Expected SNMP_STD_TYPE_SEQ	The message header is correctly formatted but as the driver continues parsing the message it can't find the bound variables.	
SNMP-STD#21	ERROR	DRV->SNMP-STD#21 : Out of udp sockets on port=%d	The FieldServer has no UDP socket or cannot bind it to a particular port. It is possible that the FieldServer is running out of memory.	Take log and call tech. support.
SNMP-STD#22		DRV->SNMP-STD#22 : Out of udp sockets		
SNMP-STD#23		DRV->SNMP-STD#23 : Socket binding error on port=%d		
SNMP-STD#51	DRIVER	SNMP-STD#51: Not enough space on DA=%s, reqd length=%d	Data array is not long enough.	This message is printed by the client side of the driver. The Client side of the driver is implemented only to test the Server side. Configure the FieldServer as a Server.
SNMP-STD#52	DRIVER	SNMP-STD#52 : Received set/get/getnext (%d) request	The Client side of the driver has received a request. It should only receive responses.	
SNMP-STD#53	DRIVER	SNMP-STD#53: Ignored received request (%d)		
SNMP-STD#54	DRIVER	SNMP-STD#54: Not a valid SNMP response	The Client side of driver has received a message which is not a valid snmp response.	
SNMP-STD#55	DRIVER	SNMP-STD#55: Encoded msg length (%d) > (%d) bytes received	Partial message is received or length was not correctly formatted in message.	
SNMP-STD#56	DRIVER	SNMP-STD#56: Response report err=%d MD=%s	A response from the remote device reports an error. The message is good but inside the message there is a field reporting an error.	
SNMP-STD#57	DRIVER	SNMP-STD#57: Incorrect variable binding format	The driver has received a message which is incorrectly formatted or contains unsupported bound variables/features. This particular error message is printed when the SNMP message does not begin with 0x30	
SNMP-STD#58	DRIVER	SNMP-STD#58: Can't parse msg: found %#x at %d	A response to a poll from the FieldServer contains a bound variable that is not supported or expected. For example an IP_ADDRESS and OPAQUE variable or a TRAP. Immediately after this message the driver prints a hex dump of the offending message.	This message is printed by the client side of the driver. The Client side of the driver is implemented only to test the Server side. Configure the FieldServer as a Server
SNMP-STD#59	DRIVER	SNMP-STD#59 : Could not read SNMP response version	The driver found an error in the message structure preventing it from extracting the SNMP version number.	

Error #	Msg Screen	Screen message	Meaning	Suggested Solution
SNMP-STD#60	DRIVER	SNMP-STD#60: Bad community string	The SNMP message contains a badly formatted community string or the community string is absent.	
SNMP-STD#61	DRIVER	SNMP-STD#61: Version. Expected=1 Rcvd=%d	This driver only supports SNMP version #1.	