A Sierra Monitor Company

Driver Manual
(Supplement to the FieldServer Instruction Manual)

FS-8700-09 Notifier 1010/2020

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after May 1, 2001

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1. Notifier 1010/2020 Description

The Notifier 1010/2020 driver allows the FieldServer to transfer data to and from Notifier 1010 and 2020 Fire Alarm Panels using the Notifier protocol. The FieldServer emulates a read only client with this driver.

The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer.

Should you use the Notifier **INA** (FS-8700-25) driver or the Notifier **NFA/1010/2020** Driver (FS-8700-09)?

Use the FS-8700-25 INA driver if your FieldServer is connected to an INA device and in turn, the Notifier field panels are connected to the INA which serves as a gateway. One INA panel can be connected to each FieldServer port.

Use the FS-8700-09 1010/2020 driver if your Fieldserver is connected to 1010 or 2020 Panel directly. One panel can be connected to each FieldServer port.

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 RS_232 use
FS-8917-10	FieldServer Technologies Cable 23020
FS-8917-03	RJ45 to DB9M connector adapter
-?????	RS_485 connection adapter
-	Driver Manual.

2.2. Provided by the Supplier of 3rd Party Equipment

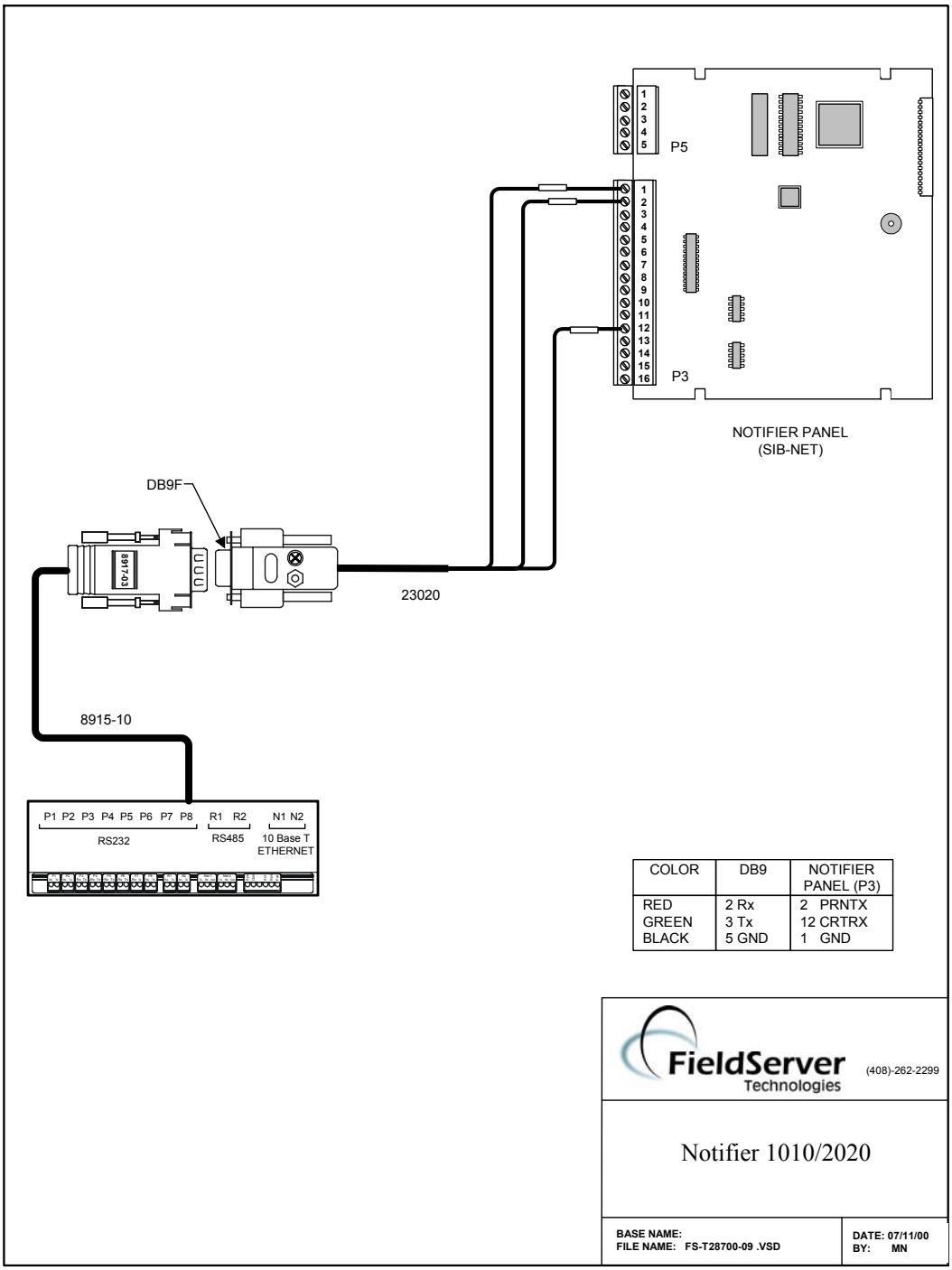
2.2.1. Hardware

Part #	Description
	Notifier Fire Panel Client, e.g. 1010, 2020

3. Hardware Connections

It is possible to connect a Notifier 1010/2020 device to any of the eight RS-232 ports or two RS-485 ports. These ports just need to be configured for a Notifier 1010/2020 in the configuration file.

Configure the PLC according to manufacturer's instructions.



4. Configuring the FieldServer as a Notifier 1010/2020 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).

The following tables indicate the parameters permissible for this driver in each of the configuration sections

4.1. Data Arrays/Descriptors

(Data arrays are predefined for this driver. The table is included for reference only.)

Section Title		
Data_Arrays		
Column Title	**Function**	**Legal Values**
Data_Array_Name	Provide name for Data Array	DA_NFA DA_STB_Px DA_TXT_Px
Data_Format	Provides data format	INT16, BIT
Data_Array_Length	Number of Data Objects	1-8192

When the customer receives a FieldServer with the Notifier driver installed, the Data Arrays are ready configured and ready to use with the 1010 or 2020. The customer only needs to configure the interface to the non-Notifier device.

The Notifier 1010/2020 driver requires some default Data Arrays. The Configuration file requires these for the reasons summarized below.

Data Array Name	Data Format	Length	Description
DA_NFA*	BIT	9400	Status Bit Data Array This Data Array contains the Alarm, trouble and other control or status bits. Please refer to section 3.2.3 for a detailed breakdown of Bits in this Array.
DA_STB_Px	INT16	2	Supervise – This is a 2-character string from Notifier providing a "supervise" signal to the Notifier Fire Alarm Panel when hot standby is alive. It also appears to the Client as 2 single coils if it is being sent.
DA_TXT_Px	INT16	800	Text_Regs - This is the text string coming from Notifier that matches the information on the display of the 1010 or 2020 and contains two sets of 400 by 16-bit registers which is equivalent to 10 lines by 80 characters for each set. The first set is in MS Byte, LS Byte order. The second set, starting at offset 400 is in LS Byte, MS Byte order.

*Note that the name of this Data Array can be changed to suit the user.
Px is the port connected to the Notifier Panel.

EXAMPLE

```
//    Data Arrays

//    Data Arrays
Data_Array_Name,          Data_Format,          Data_Array_Length

// These 2 Data Arrays must be defined - a Notifier driver requirement.
// Note that they are port specific.

DA STB P8                 Int16,                2
DA TXT P8,                Int16,                8000

// This is where the alarm bits will go (one array for each Node on the Notifier net)

DA_DI_00,                 Bit,                  9400
DA_DI_01                  Bit,                  9400
DA_DI_02                  Bit,                  9400
```

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	FS-X40 Serves: P1-P8, R1-R2 FS-X20 Serves: Serial Port
Protocol	Specify protocol used	Notifier
Baud*	Specify baud rate	2400
Parity*	Specify parity	Even
Data_Bits*	Specify data bits	7
Stop_Bits*	Specify stop bits	**1**

Example

```
// Client Side Connections

Connections
Port, Protocol, Baud, Parity, Data_Bits, Stop_Bits
P8, Notifier, 2400, Even, 7, 1
```

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	Modbus station address of physical server node	257
Protocol	Specify protocol used	Notifier.

Example

```
// Client Side Nodes

// Nodes on the Notifier Net. 257 is a default for a non-networked system.

Nodes
Node_Name Node_ID Protocol
NFA_257 257, Notifier
```

4.4. Client Side Map Descriptors

4.4.1. FieldServer Related Map Descriptor Parameters

Section Title		
Map Descriptors		
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	DA _ NFA
Data_Array_Offset	Starting location in Data Array	0
Function	Function of Client Map Descriptor	Passive

4.4.2. Driver Related Map Descriptor Parameters

Section Title		
Map Descriptors		
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
Data_Type	Data type	Coil
Length	Length of Map Descriptor	9400, 2, 800
Address	Starting address of read block	0

4.4.3. Map Descriptor Example.

Section Title							
Map Descriptors							
Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name	Type	Address	Length
SMD_DI_00	DA_DI_00	0	Passive	NFA_257	Coil	0	9400
SMD_DI_01	DA_DI_01	0	Passive	NFA_001	Coil	0	9400
SMD_DI_02	DA_DI_02	0	Passive	NFA_002	Coil	0	9400

5. Driver Notes

5.1. Status Bit Data Array Addressing

The status bit data array consists of:

- Status Bits
- Control Bits
- Command Bits

Please note that Common Bits are a factory-enabled option and that it will be necessary to contact FieldServer Technologies to have them enabled should they be required.

5.1.1. The full map for the Status Bit Data Array is as follows:

Status Bit positions in the Status Bit Data Array	
Parameter	**Data Array Location**
Detector Alarms	0 – 1023
Detector Alarms Unacknowledged	1024 – 2047
Module Alarms	2048 – 3071
Module Alarms Unacknowledged	3071 – 4095
Detector Trouble	4096 – 5119
Detector Trouble Unacknowledged	5120 – 6143
Module Trouble	6144 – 7167
Module Trouble Unacknowledged	7168 – 8191
Common Bits	8192 – 8207
Control Bits	8208 - 8209
TAC-Americas heartbeat	8210
Reserved for future use.	8211 – 8219
Zone Alarms	8220 – 8499
Zone Troubles	8500 - 8699
Level Alarms	8800 – 9099
Level Troubles	9100 - 9399

5.1.2. Calculating Status Bit Positions

The formula to calculate Status Bit position is: Where Loop =1 (If loop=10;loop=0) Detector = 1-99	
Detector Alarm location =	0 + (Loop) *100 + Detector.
Detector Alarm Unack location =	1024 + (Loop) * 100 + Detector.
Module Alarm location =	2048 + (Loop) * 100 + Module.
Module Alarm Unacknowledged location =.	3071 + (Loop) * 100 + Module
Detector trouble location =	4096 + (Loop) * 100 + Detector.
Detector Trouble Unack location =	5120 + (Loop) * 100 + Detector.
Module Trouble location =	6144 + (Loop) * 100 + Module.
Module Trouble Unack location =	7168 + (Loop) * 100 + Module.

5.1.3. Common Bit Addresses

Common Bit positions in the Status Bit Data Array Please note that common Bits are a factory enabled option.	
Parameter	**Bit**
Detector Alarms	8192
Detector Alarms Unacknowledged	8193
Module Alarms	8194
Module Alarms Unacknowledged	8195
Detector Trouble	8196
Detector Trouble Unacknowledged	8197
Module Trouble	8198
Module Trouble Unacknowledged	8199
Alarms	8200
Alarms Unacknowledged	8201
Trouble	8202
Trouble Unacknowledged	8203
Supervise Sent	8204
Ignored Message	8205
All Systems Normal	8206
ESC X NUL	8207

5.1.4. Control Bit Addresses

Control Bit positions in Data Array DA _ NFA	
Parameter	**Bit**
Ack/Step	8208
System Reset	8209

5.1.5. The TAC-Americas heartbeat bit:

Parameter	Bit
TAC-Americas Heartbeat	8210

5.1.6. Zone Alarms and Trouble Bit Addresses

Zone bit positions in the Status Bit Data Array	
Parameter	**Data Array Location**
Zone Alarms 1 bit per zone. Bit 0 is for zone zero, Bit 1 is for zone 1. Bit Number = Zone Number + 8220	8220 - 8499
Zone Troubles 1 bit per zone. Bit 0 is for zone zero, Bit 1 is for zone 1. Bit Number = Zone Number + 8500	8500 - 8699

The zone status is determined by inspection of column 40 of the message lines. If the column begins with a 'Z' then if the following character is a digit then the three characters which follow the 'Z' are interpreted as the zone number. Alternatively, if the word 'zone' is found in column 40 or 42 then the bytes which follow are interpreted as the zone number.

If the zone number is mal formed in the message Eg. 'Z00c' or 'Z1e4' or 'Zone two' then the driver will interpret and store the status information as if the zone was zone zero.

A maximum of 270 zones may be parsed and stored. If the zone number is invalid or greater than 270 then the message is ignored. The driver produces a message in the error log but does not generate a panic, as it assumes a single corrupt message has been processed. The driver may produce one of the following messages under these circumstances.

NFA/INA:#1 Err. Zone status ignored. Zone=%d > 270. Subsequent similar msgs suppressed!

NFA/INA:#2 Err. Array(%s) too short. Zone=%d. Index=%d. Subsequent similar msgs suppressed!

No common bit is provided to indicate if any zone is in alarm or trouble.

5.1.6.1. When are zone troubles and alarms cleared ?

Zone data is cleared when a 'Network System Reset' message is received.

5.2. Alarm Status Supported by the Notifier Driver

The Notifier Driver supports the following alarm states:

"ACK AL"	"ACK TB"	"ACTIVE"
"CLR AL"	"CLR TB"	"CLEAR"
"ACL AL"	"ACL TB"	"SUPERV"
"TROUBL"		"ALARM:"

5.3. Detectors Supported by the Notifier Driver

The Notifier driver supports the following detectors:

"FIXED PHOTO D"	"SMOKE ION HP"
"FIXED THER D"	"SMOKE ION LP"
"HEAT (ANALOG)"	"SMOKE (COMBO)"
"ION DUCT DET"	"SMOKE (PHOTO)"
"SMOKE (ION)"	

5.4. Modules Supported by the Notifier Driver

The Notifier driver supports the following Modules:

"ACCESS MONTR"
"ALARMS PEND"
"AREA MONITOR"
"CMX CONTROL"
"CMX FORM C"
"CONTROL"
"DACT CONNTECT"
"EQUIP MONITR"
"FORMC MANUAL"
"FORM C RELAY"
"GENERAL PEND"
"GN ALARM"
"GN ALARM EVC"
"GN ALARM FORC"
"GN SUPR FORC"
"GN TRBL FORC"
"GN WAT FORC"
"GN WATER FLW"
"MON NORM CLD"
"MON PULL STA"
"MONITOR"
"MONITOR PAGE"
"NON ALARM"
"NON ALM MON"
"PAGE"
"POWER (CONV)"
"PULL STATION"
"SMOKE (CONV)"
"SPEAKER"
"SPRNKLR MNTR"
"SPRVSRY MNTR"
"SYSTEM MONTR"
"TELEPHONE"
"TRBL MONITOR"
"TRBLS PEND"
"TROUBLE"
"TROUBLE FORC"
"WATER FLOW"

5.5. Events that will cause an Alarm

"Abort switch"
"Silence"
"Evacuate"
"PAS_Inhibit"
"Second shot"

5.6. Custom Heartbeat

A bit (8210) is set when the driver receives a heartbeat message from any panel. The bit is latched. It is only cleared when a System Reset message is received.

An upstream device can monitor this bit (and clear it) or the Fieldserver can be configured to send a message to an upstream device when the state of the bit changes. Either of these options can be achieved my modifying the FieldServer configuration CSV.

A sample of the heartbeat message is provided below. The driver looks for the bold/underlined text when checking for the heartbeat. If the transmitting panel sends any variation of this message it will not be recognized. Only 'ACTIVE' messages are considered in setting this bit.

*"ACTIVE N001 FORC **FACP ONLINE TO BCMS SYSTEM ONLINE** 10:00P 07/24/02 047"*

A separate bit it not provided for each node. The bit is set irrespective of which panel transmits the message.

Note that in addition to setting the heartbeat bit the message above will also set an alarm and unacknowledged alarm bit based on (in this example) the address of 47.

5.7. Level Status

Levels are determined by inspection of column 21 of the message.

If column 21 begins with a 'SB' then the level is considered a basement

Basements are considered as level 271-280 in calculating which bit to set in the table.

If column 21 begins with a 'G' then the level is considered a garage

Garages are considered as levels 283-299 in calculating which bit to set in the table.

If column 21 begins with a 'S' and column 23 contains a 'M' then the level is considered a mezzanine.

Mezzanine's are considered as levels 281-282 in calculating which bit to set in the table.

If column 21 begins with a 'S' and column 22 contains a digit then the level is considered a normal level.

It is very important to understand that the system cannot tell the difference between , for example, level 271 and a basement because the level number and the basement location result in the same bit being set.

<table>
<tr><th colspan="2">Level bit positions in the Status Bit Data Array</th></tr>
<tr><th>Parameter</th><th>Data Array Location</th></tr>
<tr><td>Level Alarms

Only messages beginning 'ALARM' will cause an alarm status to be updated. This is different from all other alarm status indication for this driver, where alarms are generated by 'ACTIVE' messages too.

1 bit per Level. Bit 0 is for level zero, Bit 1 is for level 1.

Bit Number = Level Number + 8800</td><td>8800 – 9099

<table><tr><td>Levels 0-270</td><td>8800-9070</td></tr><tr><td>Basements</td><td>9071-9080</td></tr><tr><td>Mezzanines</td><td>9081-9082</td></tr><tr><td>Garages</td><td>9083-9099</td></tr></table></td></tr>
<tr><td>Level Troubles

1 bit per Level. Bit 0 is for level zero, Bit 1 is for level 1.

Bit Number = Level Number + 9100</td><td>9100- 9399</td></tr>
</table>

A maximum of 300 levels may be parsed and stored. If the level number is invalid or greater than 300 then the message is ignored. The driver produces a message in the error log but does not generate a panic, as it assumes a single corrupt message has been processed. The driver may produce one of the following messages under these circumstances.

NFA/INA:#3 Err. Level status ignored. Level=%d > 300. Subsequent similar msgs suppressed!

NFA/INA:#4 Err. Array(%s) too short. Level=%d. Index=%d. Subsequent similar msgs suppressed!

No common bit is provided to indicate if any zone is in alarm or trouble.

The bits will remain set until a network system reset message is received in which case they will all be cleared.

5.8. Driver Messages

When the driver loads it sends a message to the error log to report the suitability of the driver for INA/NFA/1010/2020 devices.

INA:#1 FYI. Driver suitable for INA devices.	If you get this message you have the wrong driver
NFA:#1 FYI. Driver suitable for NFA/1010/2020 devices.	This message does not require any corrective action. It is for your information only.

The driver also validates node numbers. The Node_ID (station) must be equal to 257 for the NFA/1010/2020 driver.

NFA:#2 Err. Node_Id(=%d) should be 257 for NFA/1010/2020 driver	The message contains the offending node number. To correct the error, edit you CSV file, change the node numbers, download the modified CSV to the FieldServer and reset the FieldServer for the changes to take effect.

6. Revision History

Date	Driver Version	Document Revision	Resp	Comment
3/20/02	1.02	1b		Added supervisory alarm type and section of events that will cause an alarm
8/17/02	1.03	0	PMC	Added notes on how zone alarms and troubles are stored. Section 1.3.1.5 New section describes zone data storage, location and zone number evaluation rules. Changed the reference to 8208 as a MapDesc or array length to 9400.
8/20/02	1.03	1	PMC	Section 1.3.1.1 Added location of TAC-Americas' heartbeat bit. Section 1.3.6 new section on TAC-Americas heartbeat
9/4/02	1.04	0	PMC	Added support for Level status for TAC America's. Changed location of zone troubles from 8300 to 8220 Changed recommend length of MapDesc from 8700 to 9400 Changed max zone number to 270 Added section 1.3.7 describing levels.
9/5/02	1.05	0	PMC	Section 1.3.7 Notes on how 'Active' messages affect level status
	1.06	0	PMC	Section 1. Added notes on INA vs. NFA driver Section 1.2.2.3 Deleted some offending node examples. Section 1.3.8 New section with notes on driver messages
6/18/03	1.06	1	RJC	Fixed Typo's in 1.3.2 and 1.3.3 DUR0113
7/4/03	1.06	2	MF	Updated formatting – DUR113
7/25/03	1.06	3	JD	Cosmetic Changes. Releasing