

Driver Manual

FS-8700-09 Notifier 1010/2020

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after June 2023.



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fieldserver

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1 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.

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 the 1010 or 2020 Panel directly. One panel can be connected to each FieldServer port.

2 Driver Scope of Supply

2.1 Provided by the Supplier of 3rd Party Equipment

2.1.1 Required 3rd Party Hardware

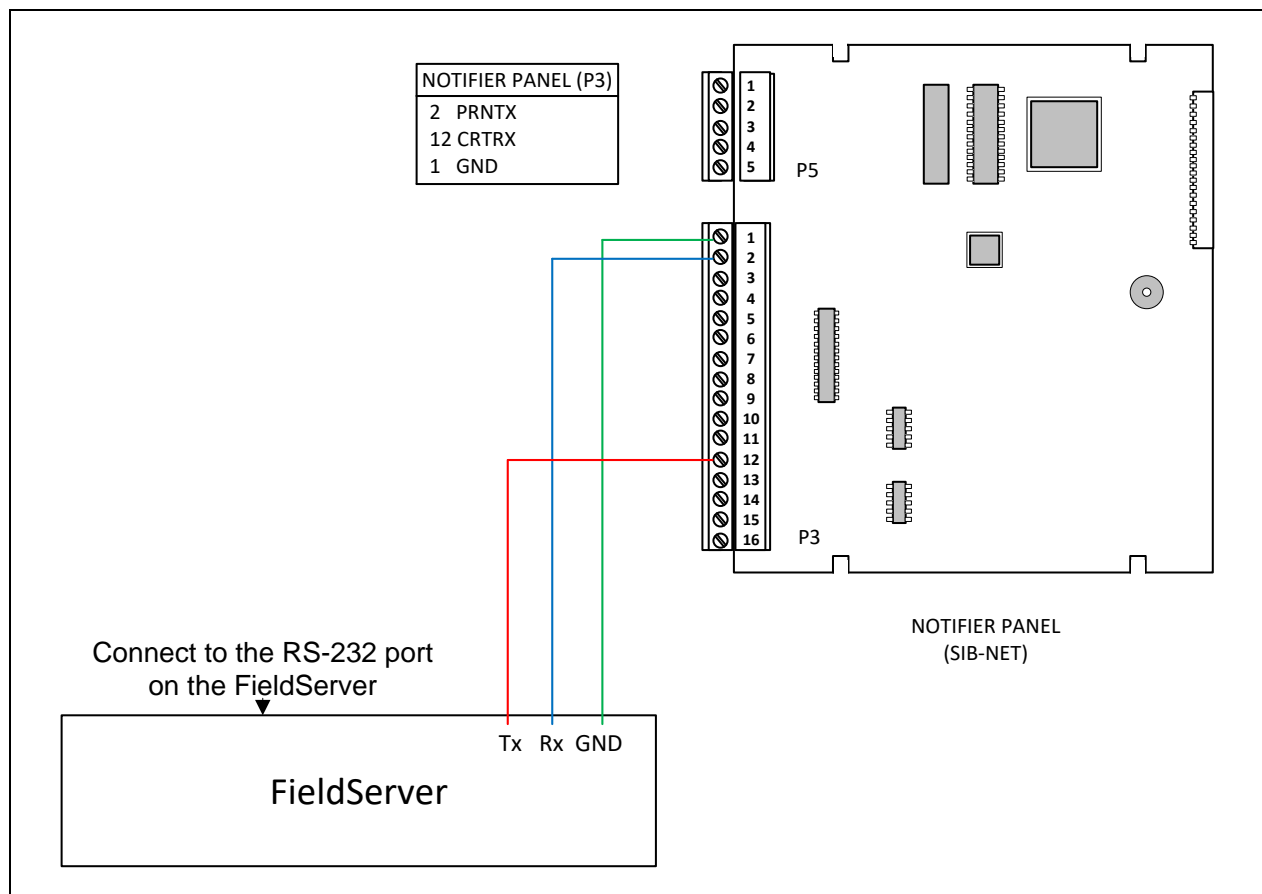
Description
Notifier Fire Panel Client (e.g. 1010, 2020)

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.

NOTE: The panel MUST output messages in English.



4 Data Array Parameters

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.	DA_NFA DA_STB_Px DA_TXT_Px
Data_Format	Provides data format.	Float, Bit, Byte, Uint16, Uint32, Sint16, Sint32
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 ¹	BIT	9400	Status Bit Data Array – This Data Array contains the Alarm, trouble and other control or status bits. Please refer to Section 6.1 for a detailed breakdown of Bits in this Array.
DA_STB_Px ²	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.

Example

```
// 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 P1            , Int16            , 2
DA_TXT P1            , 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
```

¹ The name of this Data Array can be changed to suit the user.

² Px is the port connected to the Notifier Panel.

5 Client Side Configuration

For detailed information on FieldServer configuration, 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.

NOTE: In the following tables, * indicates an optional parameter and bold legal values are default.

5.1 Client Side Connection Parameters

Section Title		
Connections		
Column Title	Function	Legal Values
Port	Specify which port the device is connected to the FieldServer.	P1-P2, R1-R2 ³
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
P1            , Notifier  , 2400   , Even    , 8         , 1
```

5.2 Client Side Node Parameters

Section Title		
Nodes		
Column Title	Function	Legal Values
Node_Name	Provide name for node.	Up to 32 alphanumeric characters
Node_ID	Identification number for this Node.	Any positive integer
Protocol	Specify Protocol used.	Notifier
Port	Specify which port the device is connected to the FieldServer.	P1-P2, R1-R2 ³

Example

```
// Client Side Nodes

Nodes
Node_Name  , Node_ID  , Protocol  , Port
Panel_1    , 1        , Notifier  , P1
```

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.

5.3 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
```

5.4 Client Side Map Descriptor Parameters

5.4.1 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.	DA _ NFA
Data_Array_Offset	Starting location in Data Array.	0
Function	Function of Client Map Descriptor.	Passive

5.4.2 Driver Related 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
Data_Type	Data type.	Coil
Length	Length of Map Descriptor.	9400, 2, 800
Address	Starting address of read block.	0

5.5 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

6 Driver Notes

6.1 Status Bit Data Array Addressing

The status bit data array consists of:

- Status Bits
- Control Bits
- Command Bits

NOTE: Common Bits are a factory-enabled option and that it will be necessary to contact MSA Safety's FieldServer support team to have them enabled if required.

6.1.1 Status Bit Data Array Map

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

6.1.2 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	$= 0 + (\text{Loop}) * 100 + \text{Detector}$
Detector Alarm Unack location	$= 1024 + (\text{Loop}) * 100 + \text{Detector}$
Module Alarm location	$= 2048 + (\text{Loop}) * 100 + \text{Module}$
Module Alarm Unacknowledged location	$= 3071 + (\text{Loop}) * 100 + \text{Module}$
Detector trouble location	$= 4096 + (\text{Loop}) * 100 + \text{Detector}$
Detector Trouble Unack location	$= 5120 + (\text{Loop}) * 100 + \text{Detector}$
Module Trouble location	$= 6144 + (\text{Loop}) * 100 + \text{Module}$
Module Trouble Unack location	$= 7168 + (\text{Loop}) * 100 + \text{Module}$

6.1.3 Common Bit Addresses

Common Bit positions in the Status Bit Data Array Please note that common Bits are a factory	
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

6.1.4 Control Bit Addresses

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

6.1.5 The TAC-Americas Heartbeat Bit

Parameter	Bit
TAC-Americas Heartbeat	8210

6.1.6 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 e.g. '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.

6.1.7 Clearing Zone Troubles and Alarms

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

6.2 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:"

6.3 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)"	

6.4 Modules Supported by the Notifier Driver

The Notifier driver supports the following Modules:

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

6.5 Events that will cause an Alarm

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

6.6 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 by 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 is 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.

6.7 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.

Level bit positions in the Status Bit Data Array		
Parameter	Data Array Location	
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	8800 – 9099	
	Levels 0-270	8800-9070
	Basements	9071-9080
	Mezzanines	9081-9082
	Garages	9083-9099
Level Troubles 1 bit per Level. Bit 0 is for level zero, Bit 1 is for level 1. Bit Number = Level Number + 9100	9100- 9399	

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.

6.8 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.

<i>INA:#1 FYI. Driver suitable for INA devices.</i>	If you get this message you have the wrong driver
<i>NFA:#1 FYI. Driver suitable for NFA/1010/2020 devices.</i>	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.

<i>NFA:#2 Err. Node_Id(=%d) should be 257 for NFA/1010/2020 driver</i>	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.
--	--

7 Troubleshooting

If the FieldServer reboots when the RS-232 serial is connected, an Optical Isolator is required to balance the ground potential problem.