

Driver Manual

FS-8700-93 Edwards EST QuickStart

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after March 2021.



Driver Revision: 1.05
Document Revision: 3.A



fieldserver

MSA Safety
1000 Cranberry Woods Drive
Cranberry Township, PA 16066 USA
Website: www.MSAsafety.com

U.S. Support Information:
+1 408 964-4443
+1 800 727-4377
Email: smc-support@msasafety.com

EMEA Support Information:
+31 33 808 0590
Email: smc-support.emea@msasafety.com

Contents

1	Description	4
2	Driver Scope of Supply	4
2.1	Supplied by MSA Safety.....	4
3	Hardware Connections	5
3.1	Hardware Connection Tips / Hints.....	5
4	Data Array Parameters	6
5	Client Side Configuration	7
5.1	Client Side Connection Parameters	7
5.2	Client Side Node Descriptors	7
5.3	Client Side Map Descriptor Parameters.....	8
5.3.1	FieldServer Specific Map Descriptor Parameters.....	8
5.3.2	Driver Related Map Descriptor Parameters	8
5.4	Map Descriptor Example	9
6	Useful Features	10
6.1	FieldServer Synchronization.....	10
6.2	Map Descriptor Example – Clear All Data Arrays	10
7	Reference	11
7.1	Device States.....	11
7.2	Data Array Memory Allocation by Card	12
7.3	Device Addressing.....	13
7.4	Message Types Supported.....	14
7.5	Error Messages	15
7.6	Driver Statistics.....	15

1 Description

The EST QuickStart Serial driver allows the FieldServer to record data from Edwards Systems Technology QS1-2/4-8 and QSC Fire Panels over the RS-232 printer port. The FieldServer acts as a Passive Client receiving messages and recording the status of Fire Alarm System points connected to the EST QuickStart fire alarm control panel in bit-oriented Data Arrays. The EST QuickStart panels do not support duplexed communications; therefore this driver has not been designed to respond or to generate polls.

The Driver is limited by the information that the EST QuickStart control panels broadcasts in the form of text messages through its RS-232 printer port.

The types of EST messages supported by this driver are listed in **Section 7.1**. Device status to Data Array mapping is also provided. Since there are a variety of optional cards that can be selected for each EST QuickStart installation, each FieldServer application must be specifically configured before use. FieldServer data storage arrays for panel status will be allocated according to the number and type of cards implemented. Message information will also be stored according to card and panel addressing.

This driver is connection oriented; therefore, only one EST Panel may be connected to any single RS-232 FieldServer port.

The driver currently accommodates European and American Conventional/Intelligent panels using the American English protocol with provisions for using the British English protocol at a later date.

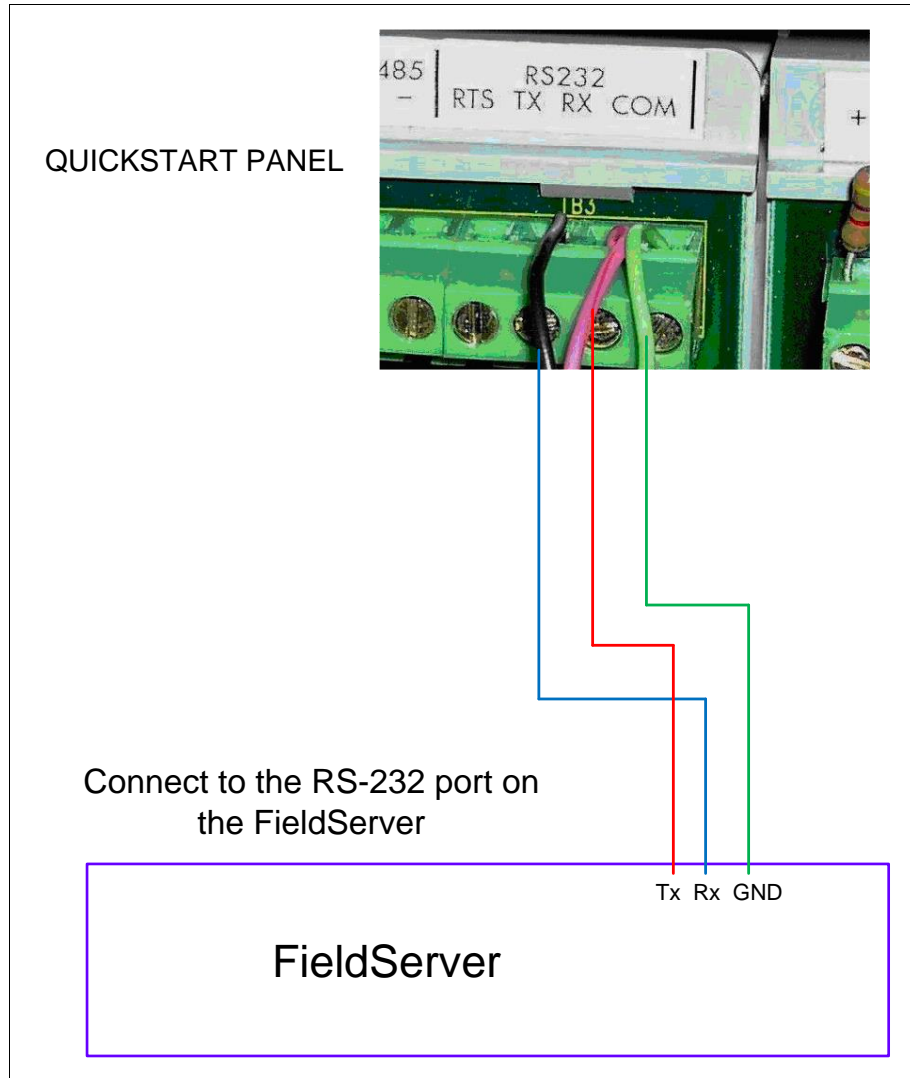
2 Driver Scope of Supply

2.1 Supplied by MSA Safety

Part #	Description
	Driver Manual

3 Hardware Connections

The FieldServer is connected to the EST QuickStart power supply card as shown below. Configure the EST QuickStart panel according to manufacturer's instructions.



3.1 Hardware Connection Tips / Hints

The QuickStart panels must be pre-configured using their own proprietary configuration tool to send messages to the RS-232 printer port. Ensure that this is done before attempting to connect to the FieldServer and verify that messages are being sent using an appropriate utility e.g. Hyperterminal.

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.	Up to 15 alphanumeric characters
Data_Format	Provide data format. Each Data Array can only take on one format.	Float, Bit, Byte, UInt16, UInt32, Sint16, Sint32
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.	1-10000

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
```

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).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a EST QuickStart Server.

It is possible to connect the Edward QuickStart panel to any RS-232 or RS-485 (with adapter) port on a FieldServer. These ports need to be configured for Protocol="qstart" in the configuration files.

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 ¹
Protocol	Specify protocol used.	qstart
Baud*	Specify baud rate.	9600 (vendor limitation)
Parity*	Specify parity.	None (vendor limitation)
Data_Bits*	Specify data bits.	8 (vendor limitation)
Stop_Bits*	Specify stop bits.	1 (vendor limitation)
Ic_timeout	Specify intercharacter timeout.	2.0s

Example

```
// Client Side Connections
Connections
Port          , Protocol   , Baud   , Parity   , Ic_Timeout
P3            , qstart    , 9600   , None     , 2.0s
```

5.2 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	Address of physical Server node.	1-255
Protocol	Specify protocol used.	qstart
Connection	Specify which port the device is connected to the FieldServer.	P1-P2, R1-R2 ¹

Example

```
// Client Side Nodes
Nodes
Node_Name   , Node_ID   , Protocol   , Connection
Node_A     , 1         , qstart    , P1
```

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.

5.3 Client Side Map Descriptor Parameters

5.3.1 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 Section 4
Data_Array_Offset	Starting location in Data Array.	0 to (Data_Array_Length-1) as specified in Section 4
Function	Function of Client Map Descriptor.	Passive

5.3.2 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
Msg_Type	Identifies the message type of the Map Descriptor.	Trouble, Other, State
Panel*	Id of QuickStart panel.	0-22, 0
Card*	Id of Card.	0-9, 0
Length*	Length of Map Descriptor.	Permissible range of addresses based on Data Array size
Address*	Starting address of read block.	0 for passive Clients

5.4 Map Descriptor Example

All messages will be recorded into the Data Arrays designated to this port as described in **Section 4**. The Message Type, Panel, Card, and Address fields are used to match the appropriate Map Descriptor for updating data.

```
// Client Side Map Descriptors
```

Map Descriptors									
Map_Descriptor_Name	Data_Array_Name	Data_Array_Offset	Function	Node_name	Msg_type	Panel	Card	Address	Length
SLV_PSEUDO	DA_PSEUDO	,0	,Passive	,Node_A	,Other	,0	,0	,0	,50
SLV_PSEUDO_TR	DA_PSEUDO_TR	,0	,Passive	,Node_A	,Trouble	,0	,0	,0	,50
SLV_ZONE	DA_ZONE	,0	,Passive	,Node_A	,Other	,0	,17	,0	,500
SLV_ZONE_TR	DA_ZONE_TR	,0	,Passive	,Node_A	,Trouble	,0	,17	,0	,500
SLV_AND_GRP	DA_AND_GRP	,0	,Passive	,Node_A	,Other	,0	,18	,0	,100
SLV_AND_GRP_TR	DA_AND_GRP_TR	,0	,Passive	,Node_A	,Trouble	,0	,18	,0	,100
SLV_MTRX_GRP	DA_MTRX_GRP	,0	,Passive	,Node_A	,Other	,0	,19	,0	,100
SLV_MTRX_GRP_TR	DA_MTRX_GRP_TR	,0	,Passive	,Node_A	,Trouble	,0	,19	,0	,100
SLV_SVC_GRP	DA_SVC_GRP	,0	,Passive	,Node_A	,Other	,0	,20	,0	,200
SLV_SVC_GRP_TR	DA_SVC_GRP_TR	,0	,Passive	,Node_A	,Trouble	,0	,20	,0	,200
SLV_TIME_CTRL	DA_TIME_CTRL	,0	,Passive	,Node_A	,Other	,0	,21	,0	,50
SLV_TIME_CTRL_TR	DA_TIME_CTRL_TR	,0	,Passive	,Node_A	,Trouble	,0	,21	,0	,50
SLV_OP_GRP	DA_OP_GRP	,0	,Passive	,Node_A	,Other	,0	,22	,0	,500
SLV_OP_GRP_TR	DA_OP_GRP_TR	,0	,Passive	,Node_A	,Trouble	,0	,22	,0	,500
SLV_CPU_RSRV	DA_CPU_RSRV	,0	,Passive	,Node_A	,Other	,1	,0	,0	,50
SLV_CPU_RSRV_TR	DA_CPU_RSRV_TR	,0	,Passive	,Node_A	,Trouble	,1	,0	,0	,50
SLV_PSEUDO	DA_PSEUDO	,0	,Passive	,Node_A	,state	,0	,0	,0	,50

In the above example:

- Data_Array_Offset – The driver internally calculates the correct offset for each message type. Refer to **Section 7.2**.
- Function – QuickStart is a passive Client and neither reads or writes to another device.
- Node_Name – There can only be one node per port. This field indirectly links the FieldServer port to a data storage array. Refer to the Client Node Parameter Section.
- Msg_Type – Messages are defined as either trouble, other or state types. The values for state that will be stored are as follows:

NORMAL	0
ALARM	1
SUPERVISOR	3
TROUBLE	4
MONITOR	6
DISABLE	7
- Address – For this driver, address should always be zero. It defines the lowest possible expected address value.
- Length – Acceptable ranges for address are determined by the card type. Each card has an expected maximum address which this field defines.

6 Useful Features

6.1 FieldServer Synchronization

To synchronize the FieldServer's Data Arrays with the QuickStart control panel's status, the panel must have no active or disabled points on FieldServer startup. Alternatively, a panel can be hard/soft restarted to clear all point status, and then re-annunciate any active devices after the FieldServer has been started. This should only be undertaken by qualified technicians.

Should the panel be soft restarted unexpectedly, the FieldServer will recognize the "restart" command and clear all internal Data Arrays. There will be no need for FieldServer restart. For a hard restart, the FieldServer Data Arrays should be manually cleared by changing a bit in the CLEAR_FLAG Data Array through FS-GUI, then soft restarting the panel again to ensure that status of all points is re-annunciated and recorded by the FieldServer.

A method for manually clearing all Data Arrays for the QuickStart driver is available. This is useful if the QuickStart Panel is hard re-started, and the user wishes to synchronize the FieldServer Data Arrays. To enable this feature, a CLEAR_FLAG Data Array needs to be declared in the configuration file that is 16 bits long. To invoke a manual clear, any bit within the array needs to be set to high or "1". (See the FieldServer Toolbox and GUI Manual for detailed instructions on user operations). After the clearing function has been completed, all bits within the CLEAR_FLAG array should be automatically set to zero again.

6.2 Map Descriptor Example – Clear All Data Arrays

```
// Data Arrays
Data_Arrays
Data_Array_Name , Data_Format , Data_Array_Length
CLEAR_FLAG      , Bit           , 16
```

```
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name , Panel , Card , Address , Length
CLEAR_CHK           , CLEAR_FLAG    , 0                , Wr bx   , Node_A    , 0    , 0    , 0    , 16
```

In the above example:

- Data_Array_Name– This array needs to be declared in order to manually reset all Data Arrays.
- Function – QuickStart is a passive Client and neither reads or writes to another device. WRBX monitors the identified Data Array for changes and invokes the clear function when this occurs.
- Node_Name – Use this default panel id, card id, and device address as dummy values.
- Address – Set to the defined length of the CLEAR_FLAG array.

7 Reference

7.1 Device States

Each addressable device connected to the QuickStart panel (real or pseudo) can have multiple states: alarm supervisory, monitor, other (security), and troubles. Since these states are not exclusive; a single addressable point may occupy multiple states at the same time.

There can only be a single alarm, supervisory, monitor and other (security) state per address, thus any restoring messages for these four states indicate that the device is clear of any active problems for these types of conditions.

There may be several trouble states for a single addressable port. These trouble states are recorded in a separate trouble array of 2 byte elements. Each array element corresponds to a device address and each bit within the element corresponds to a trouble type. The mapping of message trouble types to element bit configuration is presented in the following table. For modeling simplicity and flexibility, it is assumed that all addressable points (real or pseudo) can exist in all states.

Message Type		State	Bit/UIN16
TROUBLE OPEN	TBL OPEN RST	T	0
TROUBLE SHRT	TBL SHRT RST	T	1
LCL TROUBLE	LCL TRBL RST	T	2
DIRTY HEAD	DTY HEAD RST	T	3
COMMN FAULT	COMM FLT RST	T	4
GROUND FAULT	GND FLT RST	T	5
INTERNAL TBL	INTR TRBL RS	T	6
BAD TYPE	BAD TYPE RST	T	7
BAD PRSONATY	BAD PRSTY RS	T	8
UNEPECT DEV	UNEC DEV RST	T	9
TROUBLE	TROUBLE RST	T	10
TEST	TEST RST	T	11
DEV COMPATBL	DEV COMP RST	T	12
SERVICE GRP	SERVICE G RS	T	13
DISABLED	DISABLED RST	T	14
DISAB SOUND	DISSOUND RST	T	15

7.2 Data Array Memory Allocation by Card

Each QuickStart card (real and pseudo) is configured with BIT and UIN16 Data Arrays. The following states are recorded in the BIT array in the order listed:

- Alarms
- Supervisory
- Monitor
- Other (security)

Troubles are recorded in a separate array of UIN16 or Bit elements. Each element represents a uniquely addressable point, and each bit within the element represents a different type of trouble condition which is described by the specific trouble message.

The following table lists the BIT and UIN16 Data Array sizes that should be configured for every panel by default, and arrays for each optionally installed card. The Data Arrays configured for all QuickStart panels are for cards (real and pseudo) which always have fixed card addresses. Not all of these default Data Arrays will be utilized for every installation. Optionally installed cards can have variable card id #'s depending on the sequence the cards are installed.

Data Arrays are referenced relatively according to their declared size. Therefore, care must be taken to ensure that the array sizes are configured as below.

Card/Array Descriptions	Array Size	Data Type
Pseudo points	200	BIT
Pseudo point troubles	50	UIN16
Zones	2000	BIT
Zone troubles	500	UIN16
AND group	400	BIT
AND group troubles	100	UIN16
Matrix group	400	BIT
Matrix group troubles	100	UIN16
Service group	800	BIT
Service group troubles	200	UIN16
Time control	200	BIT
Time control troubles	50	UIN16
Output group	2000	BIT
Output group troubles	500	UIN16
CPU reserved	200	BIT
CPU reserved troubles	50	UIN16
Power card	200	BIT
Power card troubles	50	UIN16
Optional Cards		
ADC (dual loop)	2000	BIT
ADC (dual loop) troubles	500	UIN16
SLIC	2000	BIT
SLIC troubles	500	UIN16
Class A card	200	BIT
Class A card troubles	50	UIN16
Class B card	200	BIT
Class B card troubles	50	UIN16
Relay card	200	BIT
Relay card troubles	50	UIN16
Annunciator (per card)	200	BIT
Annunciator troubles (per card)	50	UIN16
Dialer	200	BIT
Dialer troubles	50	UIN16

7.3 Device Addressing

The following table defines the address space expected by the driver for each type of card. The table includes both physical and pseudo points used by the QuickStart systems.

	Panel	Card	Address	Card Type
Point Addressing	0	0	0-18 (49)	pseudo points
	0	17	0-480 (499)	zone
	0	18	0-64 (99)	AND group
	0	19	0-64 (99)	matrix group
	0	20	0-128 (199)	service group
	0	21	0-32 (49)	time control
	0	22	0-250 (499)	output group
	1	0	0-32 (49)	CPU (reserved)
	2	0	0-33 (49)	annunciator
	3	0	0-33 (49)	annunciator
	4	0	0-33 (49)	annunciator
	5	0	0-33 (49)	annunciator
	6	0	0-33 (49)	annunciator
	7	0	0-33 (49)	annunciator
	8	0	0-33 (49)	annunciator
	9	0	0-33 (49)	annunciator
	1	01-07	0-341 (499)	ADC
	1	01-07	0-275 (499)	SLIC
	1	01-13	0-19 (49)	Class B (ZA16-8)
	1	01-13	0-11 (49)	Class A (ZA8-2)
	1	01-13	0-11 (49)	Relay (ZR-8)
	1	14	0-16 (49)	Dialer (DLD)
	1	15	0-24 (49)	Power (PS6)

7.4 Message Types Supported

The driver reports messages that directly affect device status only. The following set of events and messages will be recognized and recorded in the Data Arrays.

Event Description Text Strings		State	Comments
ACTIVATE RESTART			-OPERATOR COMMAND- clears all the Data Arrays
QUIESCENT	QUIE RST		Not Implemented
ALARM ACTIVE	ALARM RST	A	
PULL STATION	PULL STA RST	A	
HEAT ALARM	HEAT ALM RS	A	
WATERFLOW	WATERFLOW RS	A	
STAGE ONE		A	
SUPERVISORY	SUP RST	S	
TAMPER	TAMPER RST	S	
SECURITY	SECURITY RST	O	
FIREPHONE	PHONE RST	M	
MONITOR	MONITOR RST	M	
LATCH SUPV	LAT SUPV RST	S	
LATCH TAMPER	LAT TAMP RST	S	
UNKNOWN	UNKNOWN RST	O	
ALARM VERIFY	ALM VFY RST	M	
PREALARM	PREALARM RST	M	
TROUBLE OPEN	TBL OPEN RST	T	
TROUBLE SHRT	TBL SHRT RST	T	
LCL TROUBLE	LCL TRBL RST	T	
MAINT ALERT	MAT ALERT RS	M	
DIRTY HEAD	DTY HEAD RST	T	
COMMN FAULT	COMM FLT RST	T	
GROUND FAULT	GND FLT RST	T	
INTERNAL TBL	INTR TRBL RS	T	
BAD TYPE	BAD TYPE RST	T	
BAD PRSONATY	BAD PRSTY RS	T	
UNEPECT DEV	UNEC DEV RST	T	
TROUBLE	TROUBLE RST	T	
RELAY CONFIR	RLY CFRM RST	M	
LCL MONITOR	LCL MNTR RST	M	
SWITCH	SWITCH RST	M	
TEST	TEST RST	T	
DEV COMPATBL	DEV COMP RST	T	
AND GROUP	AND GRP RST	A	
MATRIX GROUP	MATRIX G RST	A	
SERVICE GRP	SERVICE G RS	T	
TIME CONTROL	TIME CNTL RS	M	
ACK	ACK RST	M	
DISABLED	DISABLED RST	T	
DISAB SOUND	DISSOUND RST	T	
OBJECT RUN	OBJETRUN RST	M	
ZONE ALARM	ZONE ALM RST	A	
ZONE SUPER	ZONE SUP RST	S	
ZONE MONITOR	ZONE MON RST	M	
OUTPUT GROUP	OUTPUT G RST	M	
AUDIBLE	AUDIBLE RST	M	
VISUAL	VISUAL RST	M	
SUPER OUTPUT	SUPER OUT RT	M	
NONSUPER OUT	NONSUP OUT R	M	
COMM ALM OUT	COMMALOUTRST	M	
LED OUTPUT	LEDOUTPU RST	M	

7.5 Error Messages

Error Message	Corrective Action
Qstart:#1 Err. Illegal Map Descriptor length - defaulting to 1	Check configuration file settings, the length field is not appropriately set. ²
Qstart:#2 Err. Card value error	Check configuration file settings, printed circuit board card id numbers must be 0-22 per QuickStart's addressing scheme above. ²
Qstart:#3 Err. Panel value error	Check configuration file settings, panel id numbers must be 0-9 per QuickStart's addressing scheme above. ²
Qstart:#4 Err. Message Type error	Check configuration file settings, message type must be either "trouble", or "other". ²
Qstart:#5 Err. Test file <%s> not found.	For developmental diagnostics only, call technical support.
Qstart:#6 Err. Diagnostic line ignored.	For developmental diagnostics only, call technical support.
Qstart:#7 Err. parsing Event message\n%s	Call technical support.
Qstart:#8: Err. storing Event message\n%s	Call technical support.
Qstart:#9 Err. Message address <%d> exceed Data Array size <%d>	Call technical support.
Qstart:#10 Err. Incoming data is being abandoned on port %d. MapDesc's are required to define storage for message:\n%s	Check that a valid Map Descriptor exists in the configuration files for message. Call technical support.
Qstart:#17 Err. No polling allowed. Presumed write thru abandoned! Map Descriptor <%s>	Writes are not possible; avoid writes from SCADA system.

7.6 Driver Statistics

The following table identifies statistics generated by the EST QuickStart serial driver and their meanings.

Driver Statistics Recorded	Explanation
Message received	Total number of messages of all types.
Bytes received	Total number of bytes received by all message types.
Message ignored	Ignored messages include those discarded by the complete function's sliding window criteria, and unrecognized messages in the parsing function. The sliding window discards the first line of three line messages if the correct line pattern is not recognized. Therefore, this stat counts both discarded lines, and messages if they could not be parsed.
Protocol	Protocol error, the message is recognized but does not take a valid form.

² Modify the configuration CSV file, transfer the modified file to the FieldServer and reset the FieldServer for the modifications to take effect.