

Driver Manual

FS-8700-39 EST3-ECP

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after February 2021.



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fieldserver

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Contents

| | | |
|----------|---|-----------|
| 1 | Description | 4 |
| 2 | Driver Scope of Supply | 4 |
| 2.1 | Supplied by MSA Safety..... | 4 |
| 2.2 | Provided by the Supplier of 3 rd Party Equipment | 4 |
| 2.2.1 | Hardware..... | 4 |
| 2.2.2 | Required 3 rd Party Configuration..... | 4 |
| 3 | Hardware Connections | 5 |
| 3.1 | Connect the EST3 Panel to the Multiport FieldServer | 5 |
| 3.2 | Pinouts..... | 5 |
| 3.3 | Connect the EST3 Panel to the QuickServer | 6 |
| 3.4 | Connection Notes | 6 |
| 4 | Data Array Parameters | 7 |
| 5 | Client Side Configuration | 8 |
| 5.1 | Client Side Connection Parameters | 8 |
| 5.2 | Client Side Node Parameters | 9 |
| 5.3 | Client Side Map Descriptor Parameters | 9 |
| 5.3.1 | FieldServer Specific Map Descriptor Parameters | 9 |
| 5.3.2 | Driver Related Map Descriptor Parameters | 10 |
| 5.4 | Map Descriptor Examples | 12 |
| 5.4.1 | Example 1 | 12 |
| 5.4.2 | Example 2 | 12 |
| 5.4.3 | Example 3 | 12 |
| 6 | Useful Features | 13 |
| 6.1 | Panel Masks | 13 |
| 6.2 | Setting up Multiple Parameters | 13 |
| 6.3 | Priority..... | 13 |
| 6.4 | Report and Delta Service | 13 |
| 6.4.1 | Report Service (regular polling) | 13 |
| 6.4.2 | Delta Service (unsolicited messages)..... | 13 |
| 6.4.3 | Example Configuration Using Delta Mode Only..... | 14 |
| 6.5 | Optional Data Arrays | 15 |
| 6.5.1 | Relay Confirmation State | 15 |
| 6.5.2 | EST_Types_DA..... | 15 |
| 6.5.3 | EST_Types_Update | 15 |
| 6.5.4 | DA_Bit_Name..... | 16 |
| 6.5.5 | EST_Report_Type | 16 |
| 6.6 | Object Types and Required Parameters | 16 |
| 6.7 | Set Date and Time To Panel | 18 |
| 7 | Troubleshooting | 19 |
| 7.1 | Multiple Com Errors | 19 |
| 8 | Reference | 19 |
| 8.1 | EST3 Data Format..... | 19 |
| 8.1.1 | Input data format | 19 |
| 8.1.2 | Output data format | 22 |
| 8.2 | EST3 ECP Connection Statistics..... | 23 |
| 8.3 | Driver Error Messages..... | 24 |

1 Description

The EST3 External Communications Protocol (ECP) driver allows the FieldServer to transfer data to and from Edwards EST devices over RS-232 or RS-485 (with converter) serial ports using the EST3 ECP protocol. In the EST application the FieldServer always emulates a Client.

The FieldServer makes use of the following ECP Services.

Read Operations:

- Report Service
- Delta Service

Write Operations:

- Command Service

All read points are continually updated using the Report Service; response times are enhanced using Delta Service broadcasts by the EST3 panel.

2 Driver Scope of Supply

2.1 Supplied by MSA Safety

| Part # | Description |
|------------|--|
| FS-8915-10 | 7-ft Cat-5 cable with RJ45 connectors at both ends |
| FS-8917-16 | Cable, EIA232:485 Pigtail RJ45 Port |

2.2 Provided by the Supplier of 3rd Party Equipment

2.2.1 Hardware

Check to make sure that RS-232 daughter board is installed on the CPU board.

| Part # | Description |
|-----------------------|--|
| | EST3 Gateway |
| 3-RS-232 Card Rev 5.0 | Needs to be installed for PAL chip Rev 1.1 |
| 3-RS-232 Card Rev 6.0 | Needs to be installed for PAL chip Rev 1.2 |

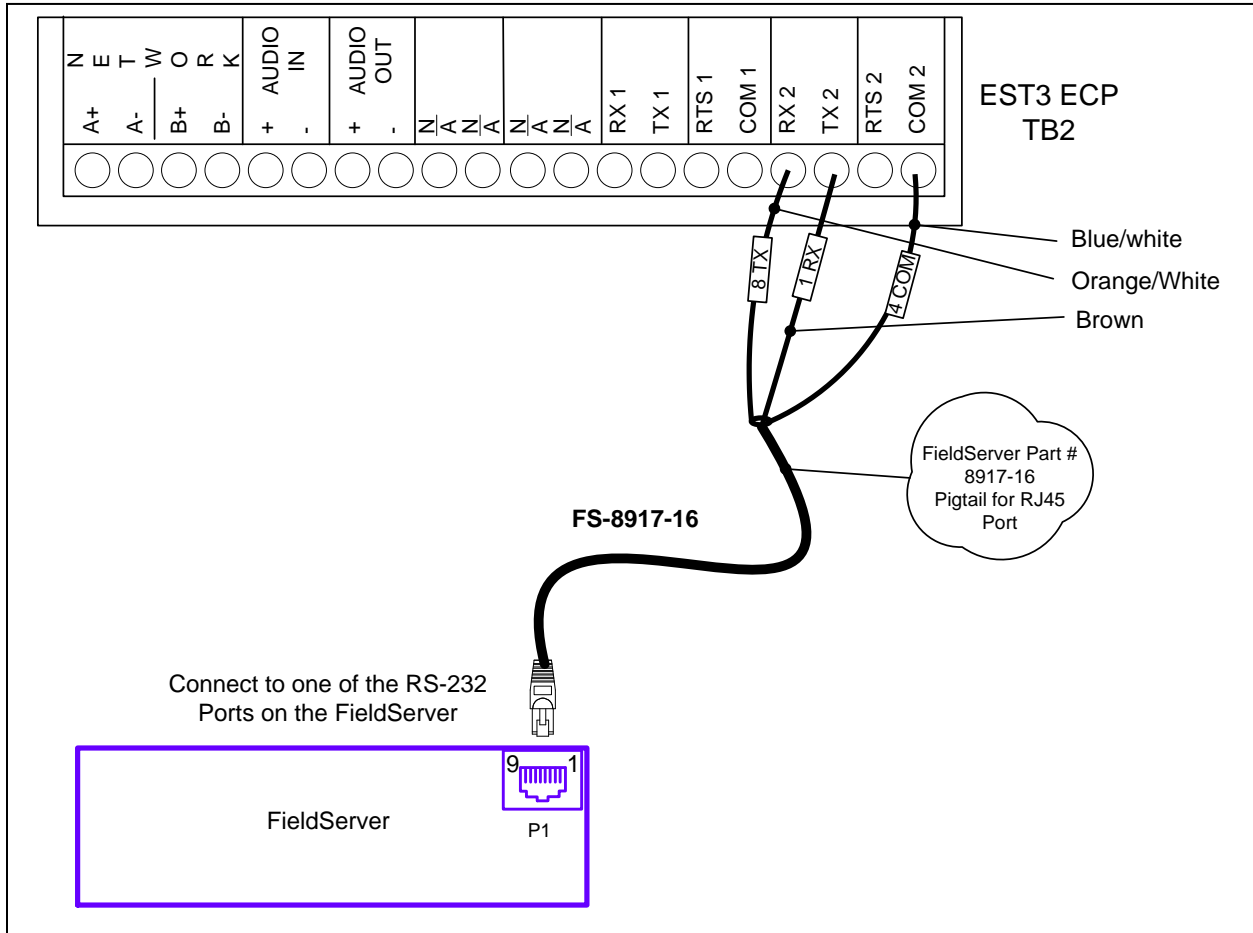
2.2.2 Required 3rd Party Configuration

The EST3 panel has to be set into the “Gateway Mode” using the EST3 Configuration tool (3-SDU).

| Possible Protocols | |
|------------------------|---------------|
| ECP Type II | Supported |
| ECP Type II with Text | Not Supported |
| ECP Type III | Supported |
| ECP Type III with Text | Not Supported |

3 Hardware Connections

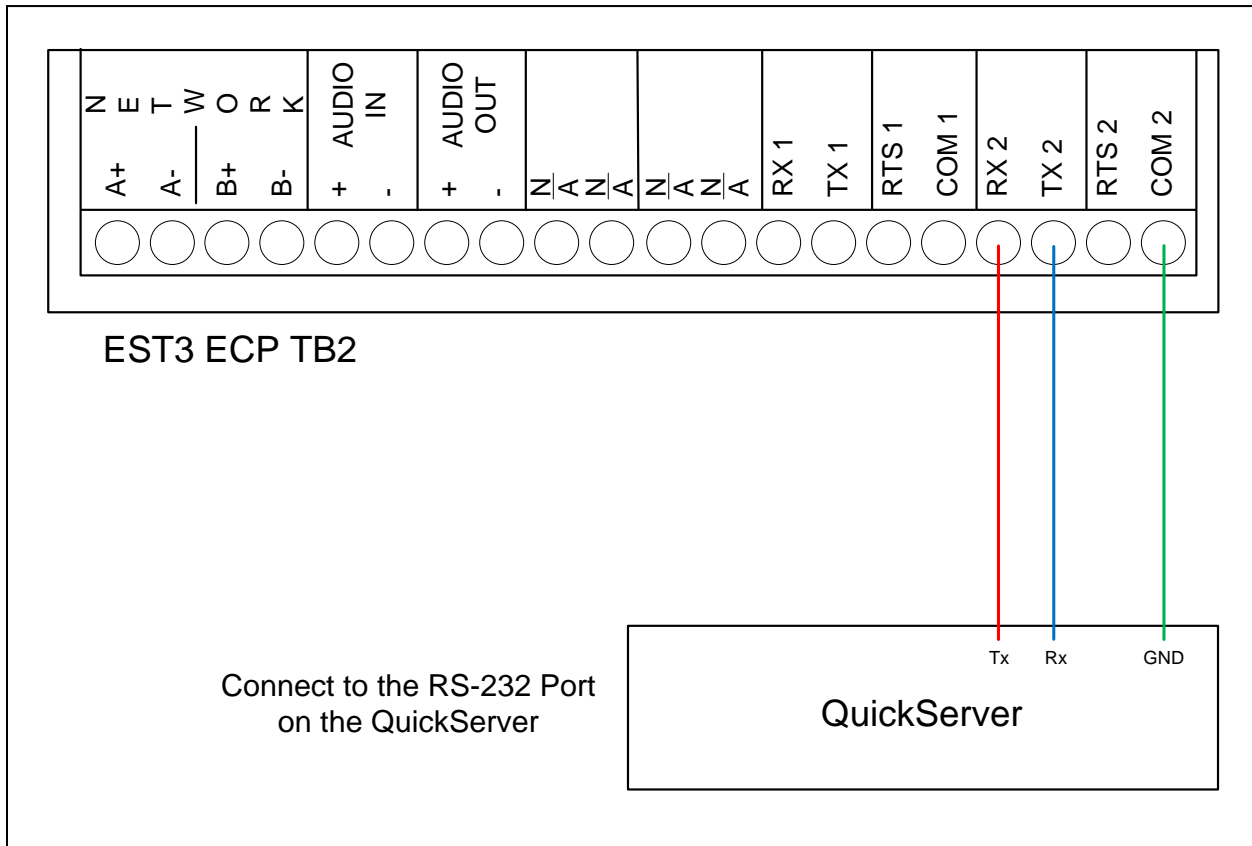
3.1 Connect the EST3 Panel to the Multiport FieldServer



3.2 Pinouts

| RJ-45 Pin | From RJ-45 | Color | To EST3 ECP TB2 |
|-----------|------------|--------------|-----------------|
| 1 | RX | Brown | TX 2 |
| 8 | TX | White/Orange | RX 2 |
| 4 | COM | Blue/white | COM 2 |

3.3 Connect the EST3 Panel to the QuickServer



3.4 Connection Notes

- There is normally only one interface to an EST3 system, even if multiple panels exist. All data for the entire system is received through this single interface.
- The interface on the EST3 panel may be COM1¹ or COM2, but it needs to be configured in the EST3 panel as a gateway. Gateway Type III is recommended.
- The EST3 panel monitors the quality of communications to the FieldServer and will detect a poor connection. Poor connections are normally caused by inappropriate selection of gateway type but can also be related to installation quality.

¹ For single port operation, Port 1 may not operate correctly on system startup. This may be reported as a communications error or may simply result in communication problems with the RS-232 port. 3-CPU3 units with date codes 07120 or later do not exhibit this issue because of the version of firmware used. No action is required. 3-CPU3 with date codes earlier than 07120 may exhibit this issue. Units that do exhibit the issue must be replaced with newer units. Date code format is: YYDDD. For example, 12145, that is 2012 May 24 (145th day of the year).

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_Array_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_Array_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 an EST3 Server.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for EST3 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: 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 ² |
| Baud | Specify baud rate. | 9600, 19200 ³ |
| Parity* | Specify parity. | None |
| Data_Bits* | Specify data bits. | 8 |
| Protocol | Specify protocol to be used by this port. | EST3 |

Example:

```
// Client Side Connections

Connections
Port          , Baud    , Parity  , Data_Bits , Protocol
P1            , 19200  , None   , 8         , EST3
```

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.

³ Edwards Recommends 19200-baud minimum in order to prevent buffer overruns in the EST3 panel.

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 | MAC ID of Panel. | 1 – 24 (normally 1) |
| Protocol | Specify protocol used. | EST3 |
| Port | Specify which port the device is connected to the FieldServer. | P1-P2, R1-R2 ² |
| Timeout | Specify time allowed between poll and response. | ≥10 seconds |
| IC_Timeout | The IC_Timeout parameter monitors the time between characters in a response. If the time exceeds the IC_Timeout, the response is discarded and is considered a Timeout. | 0-0.5s, 0.05s , recommended 0.5s |
| EST_MX_Read_Points* | Specify the maximum number of points that can be polled in single request. Legacy panel firmware (prior to spec version 5.20) supports a maximum of 34, but new firmware supports a maximum of 15. | 1-34 |
| EST_StatusTime_Format* | Specify the format to store status time in EST_StatusTime_DA Data Array. | yyyy, mm, dd, hh, mm, ss |
| Est_Independent_Events* | Specify if events from panel should be considered independent of each other or not. If events are independent, the driver will store and clear any event on receiving a message from the panel. If events are not independent, the driver will store the current event and clears all other events for the point. | Yes, No |

Example

```
// Client Side Nodes

Nodes
Node_Name , Node_ID , Protocol , Port , Timeout , IC_Timeout , EST_Mx_Read_Points
EST_1 , 1 , EST3 , P1 , 10s , 0.5s , 15
```

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 maximum specified in Section 4 |
| Function | Function of Client Map Descriptor. | RDBC, WRBC ⁴ , WRBX |

⁴ WRBC is not recommended, as startup values may be invalid.

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 Section 5.2 |
| EST_Panel | Panel | 0 - 63 |
| EST_Card | Card | 0 - 255 |
| Address | Starting address of read block. | 0 - 2127 |
| Length | Length of Map Descriptor. Longer map descriptors (where possible) are better from a performance point of view, as well as from a memory use point of view, since each map descriptor comes with a memory overhead as well as a protocol handshaking overhead. | Reads: 1 to maximum address of panel and card. A length of up to 34 is recommended. Older panels do not accept odd numbers. Writes: 1 |
| EST_Object_Type | Object type parameter. | Relay, Led, ServGroup, GuardPtrl, ChkInGrp, AltMessage, Reset, PanelSil, AlarmSil, Drill, GAlnhibit, Reboot, Evacuate, AltSensitiv, Partition, CmdList, Input, Zone, Card, AndGroup, Matrix, TimeCtrl, InstructionText, AmpPower, AudMsg, CmdList, MCmsg, SetDate, SetTime |
| EST_Index | Index parameter | 0 - 65535 |
| EST_Route | Route parameter | 0 - 255 |
| EST_Priority | Pri parameter | 0 - 4 (refer to Section 6.3) |
| EST_Chan | Chan parameter | 0 - 255 |
| EST_Msg_Index | MsgIndex parameter | 0 - 65535 |
| EST_Account | Account parameter | 0 - 255 |
| EST_ConfCL | ConfCL parameter | 0 - 65535 |
| EST_Panel_Mask_1 | PanelMask(1) parameter (LSB) | 0 - 255 |
| EST_Panel_Mask_2 | PanelMask(2) parameter | 0 - 255 |
| EST_Panel_Mask_3 | PanelMask(3) parameter | 0 - 255 |
| EST_Panel_Mask_4 | PanelMask(4) parameter | 0 - 255 |
| EST_Panel_Mask_5 | PanelMask(5) parameter | 0 - 255 |
| EST_Panel_Mask_6 | PanelMask(6) parameter | 0 - 255 |
| EST_Panel_Mask_7 | PanelMask(7) parameter | 0 - 255 |
| EST_Panel_Mask_8 | PanelMask(8) parameter (MSB) | 0 - 255 |
| EST_Types_Update* | Update the default Types list or refer to new list. Requires 'EST_Types_DA' parameter to be defined (refer to Section 6.5.3). | -, yes , new list |
| Data_Array_Low_Scale* | Scaling zero in Data Array | -32767 to 32767, 0 |
| Data_Array_High_Scale* | Scaling max in Data Array | -32767 to 32767, 100 |
| Node_Low_Scale* | Scaling zero in Connected Node | -32767 to 32767, 0 |

Configuring the FieldServer

| | | |
|---------------------|--|---|
| Node_High_Scale* | Scaling max in Connected Node. | -32767 to 32767, 100 |
| EST_Status_DA | Data Array to store Point Status (refer to example in Section 5.4.3). | One of the Data Array Names declared in Section 4 |
| EST_Alarm_DA* | Data Array to store Alarm state. ⁵ | |
| EST_Trouble_DA* | Data Array to store Trouble state. ⁵ | |
| EST_Supervisory_DA* | Data Array to store Supervisory state. ⁵ | |
| EST_Monitor_DA* | Data Array to store Monitor state. ⁵ | |
| EST_COActive_DA* | Data Array to store CO active state. ⁵ | |
| EST_Others_DA* | Data Array to store state other than Alarm, Trouble, Supervisory or Monitor. ⁵ | |
| EST_Active_DA* | Data Array to store the raw value of the active bit. | |
| EST_Relay_Conf_DA* | Relay confirmation state. Refer to Section 6.5 for more information. | |
| EST_Types_DA* | Data Array to hold Types category (refer to Section 6.6). | |
| DA_Bit_Name* | Acknowledge State (refer to Section 6.5.4). | |
| EST_Report_Type* | Store information from particular Report | -, Point I/O Status , Sensitivity, Date Time |
| EST_Store_Type* | This parameter is applicable only to Map Descriptors where EST_Report_Type is 'Point I/O Status'. If this parameter is not defined and/or the value is other than 'Status', the Driver will store raw 16 Bit data in the Data Array pointed to by the Data_Array_Name parameter of the Map Descriptor. If the value of this parameter is 'Status' then the Driver will store the most recent status of the point. Since the Data_Array_Name Data Array and the Data Array under EST_Status_DA will hold the same data, EST_Status_DA may be omitted (refer also to Section 5.4.3). | Status All other values will be ignored and will not have any affect. |
| EST_StatusTime_DA* | Data Array to store FieldServer's time when Point Status changes. By default, or when Node parameter EST_StatusTime_Format is set to ss, driver will store FieldServer's Time in seconds since 1 Jan 1970. If EST_StatusTime_Format is yyyyymmddhhmmss driver will store time as year, month (1-12), date (1-31) hour (0-23) minutes (0-59) seconds (0-59) in 6 sequential data array locations. ⁶ | One of the Data Array Names declared in Section 4 |

⁵ Refer to **Section 6.4** and **Section 5.4.2**.

⁶ Timestamp will be recorded only when MD is configured to store Point Status i.e. either EST_Status_DA is used or EST_Store_Type is set to 'Status'.

5.4 Map Descriptor Examples

5.4.1 Example 1

```
// Client Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name , EST_Panel
MD_LED_1 , DA_AI_01 , 0 , Rdbc , EST_1 , 1

, EST_Card , Address , Length , EST_Store_Type , Scan_Interval
, 1 , 0 , 20 , Status , 5.0s
```

5.4.2 Example 2

This Map Descriptor will cause the specified EST point to be read every 50 seconds (subject to throughput constraints); the full 16-bit status values received from regular polls will be stored in Data Array DA_AI_01 at offsets 0 – 19, and the Alarm, Trouble, Supervisory, Monitor or Other status (received by regular poll, or Delta message) will be stored in Data Arrays TROUBLES and ALARMS, SUPERVISORY, MONITOR, OTHERS also at offsets 0 – 19. Refer also to **Section 8**.

```
// Client Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , EST_Trouble_DA , EST_Alarm_DA
MD_LED_1 , DA_AI_01 , 0 , Rdbc , TROUBLES , ALARMS

, Node_Name , EST_Panel , EST_Card , Address , Length , Scan_Interval
, EST_1 , 1 , 1 , 0 , 20 , 50s
```

5.4.3 Example 3

This Map Descriptor will cause the specified EST point to be read every 50 seconds (subject to throughput constraints). The full 16-bit status values received from regular polls will be stored in Data Array DA_AI_01 at offsets 0 – 19, and the *Classification* as Alarm, Trouble, Supervisory, Monitor, Other, Relay Confirmation, COActive, Pre-Alarm, Disabled or Test status in the Data Array STATUS at offsets 0 – 19. Refer also to **Section 8.1**.

The classification values are as follows:

| | | | |
|-------------|---|--------------------|----|
| Normal | 0 | Relay confirmation | 6 |
| Alarm | 1 | CO Active | 7 |
| Supervisory | 2 | Pre-Alarm | 8 |
| Trouble | 3 | Disabled | 9 |
| Monitor | 4 | Test | 10 |
| Other | 5 | | |

```
Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , EST_Status_DA , Node_Name
MD_LED_1 , DA_AI_01 , 0 , Rdbc , STATUS , EST_1

, EST_Panel , EST_Card , Address , Length , Scan_Interval
, 1 , 1 , 0 , 20 , 50s
```

6 Useful Features

6.1 Panel Masks

The 8 PanelMask parameters combine to form a 64-bit field in which each bit denotes an EST panel in the network. Commands that use the Panel Masks are executed by each panel for which the corresponding bit is set. The Map Descriptor need only define non-zero bytes in the PanelMask. Typically, this will be EST_Panel_Mask_1 with a value of 1.

6.2 Setting up Multiple Parameters

The multiple parameters required by a command must be stored in consecutive locations in the Data Array specified by the Map Descriptor, starting at the specified Data_Array_Offset. All parameters must be set up before the EST command is executed. This is done using a Block Write (if supported by the protocol originating the data). All parameters are set up in a single write operation, and the EST command is triggered with all values in place.

6.3 Priority

The write priority has the possible values of Set, Latch, Low, Medium, and High. These are encoded as 00h, 01h, 02h, 03h and 04h respectively.

6.4 Report and Delta Service

The EST ECP3 Report and Delta services report point status slightly differently. The FieldServer EST3 driver deals with these differences as follows:

6.4.1 Report Service (regular polling)

The full 16-bit point status is stored to the Read Map Descriptor's Data Array. If optional Data Arrays are configured, then the point status is also interpreted according to its Alarm, Trouble, Supervisory or Monitor status and the corresponding Data Array is updated. See **Section 6.5** for details.

6.4.2 Delta Service (unsolicited messages)

Delta Service messages do not provide the same 16-bit status value as supplied by the Report Service. For this reason, **ONLY** the optional Data Arrays will be updated when a Delta message is received. Delta messages will therefore only have an effect when optional Data Arrays have been configured. The delta service will be sent out through ECP automatically. There's no panel setting for this. The EST3 panel always sends a delta frame when there is a state change. Refer also to **Section 6.5** for additional details.

6.4.3 Example Configuration Using Delta Mode Only

NOTE: It is recommended that at least one active Map Descriptor is defined to alert the Driver if the connection fails. As many passive Clients as desired can then be appended.

| Ports | |
|-------|-------|
| Port | Baud |
| P1 | ,9600 |

| Nodes | | | | |
|-----------|---------|------|----------|---------|
| Node_Name | Node_ID | Port | Protocol | Timeout |
| Node_A | ,1 | ,P1 | ,EST3 | ,4s |

| Data_Arrays | | |
|-----------------|-------------|-------------------|
| Data_Array_Name | Data_Format | Data_Array_Length |
| DA_TEST1 | , Uint16 | , 100 |
| DA_TROUBLE | , Bit | , 40 |
| DA_ALARM | , Bit | , 40 |

| Map_Descriptors | | | | | |
|---------------------|---------------|-----------------|-------------------|------------------|-----------|
| Map_Descriptor_Name | Scan_Interval | Data_Array_Name | Data_Array_Offset | Function | Node_Name |
| MD_TEST1 | ,10.0s | , DA_TEST1 | , 0 | , Rdbc | , Node_A |
| MD_TEST2 | ,- | , DA_TEST1 | , 20 | , Passive_Client | , Node_A |

| , EST_Panel | , EST_Card | , Address | , Length | , EST_Trouble_DA | , EST_Alarm_DA |
|-------------|------------|-----------|----------|------------------|----------------|
| ,1 | ,1 | ,0 | ,20 | , DA_TROUBLE | , DA_ALARM |
| ,7 | ,3 | ,130 | ,20 | , DA_TROUBLE | , DA_ALARM |

6.5 Optional Data Arrays

When optional parameters (EST_Alarm_DA, EST_Trouble_DA, EST_Supervisory_DA, EST_Monitor_DA, or EST_COActive_DA) are used, the driver automatically separates the Alarm Trouble, Supervisory, Monitor, CO Active bit from the incoming EST message and places the bit(s) in these Data Arrays at the same offset as the incoming message. Other types can be stored in EST_Others_DA Data Array. Only one Data type will be reported as active at a particular time; i.e. if Alarm is reported Driver will set Alarm bit and reset corresponding bits from Trouble, Supervisory and Monitor Data Arrays. The Driver does not correlate other types with Alarm, Trouble, Supervisory or Monitor types. For different point types the active bit has a different meaning. If the user is interested in the meaning, the EST_Supervisory_DA Data Array should be configured. If the user is interested in the raw value of the Active bit, the data array EST_Active_DA should be configured.

6.5.1 Relay Confirmation State

The driver can store the relay confirmation state of a point in a Data Array under the parameter EST_Relay_Conf_DA parameter.

0 – Relay state is not confirmed; 1 – Relay state confirmed.

6.5.2 EST_Types_DA

If it is necessary to override the default Types and Category list (**Section 8.1.1**) the EST_Types_DA parameter should be used.

For example, to put HEAT type into the “Monitor” category where all other defaults remain the same, preload the data array as follows:

| | | | | |
|-----------------|---|--------------------|---|--------------------|
| Preloads | | | | |
| Data_Array_Name | , | Preload_Data_Index | , | Preload_Data_Value |
| DA_Types | , | 2 | , | 4 |
| | | | | 1 |

Preload_Data_Index is the type of device and Preload_Data_Value holds the category for the specified device type. The legal values for Preload_Data_Value are listed below:

| | |
|-------------|---|
| Alarm | 1 |
| Supervisory | 2 |
| Trouble | 3 |
| Monitor | 4 |
| Others | 5 |
| CO Active | 7 |

6.5.3 EST_Types_Update

If this parameter is not defined or is “yes”, the driver will update its internal driver list according to the parameters preloaded under EST_Types_DA. If the parameter is set to “New List”, the driver will use ONLY the parameters defined under EST_Types_DA and will not reference or update the default list at all. The driver will therefore not store any data for types that do not have preloaded categories.

6.5.4 DA_Bit_Name

The “Acknowledge⁷” state of a point is stored under this Data Array if configured.

- 0 – Acknowledged or Acknowledge not required.
- 1 – Point is not Acknowledged yet. To Acknowledge the point change the value to “0”.

6.5.5 EST_Report_Type

The dirtiness of a device can be stored as a value *10 for System Sensor Devices and as the actual value for other Device Types (the panel sends % for other Device Types).

| Map_Descriptors | | | | | |
|---------------------|-----------------|-------------------|----------|---------------|-----------------|
| Map_Descriptor_Name | Data_Array_Name | Data_Array_Offset | Function | Node_Name | EST_Report_Type |
| MD_Poll_Sensitivity | DA_Dirtiness | 0 | Rdbc | EST_1 | Sensitivity |
| EST_Panel | EST_Card | Address | Length | Scan_interval | |
| 1 | 2 | 1 | 3 | 5.0s | |

6.6 Object Types and Required Parameters

The tables below list the fields required for the Map Descriptor implementing each object type.

| Object Type | Required Parameters |
|--|--|
| Activate and Restore Commands (01h and 11h) | |
| Relay | EST_Panel, EST_Card, Address, EST_Priority |
| Led | EST_Panel, EST_Card, Address, EST_Priority |
| ServGroup | EST_Index |
| GuardPtrl | EST_Index, EST_Route |
| ChkInGrp | EST_Index |
| AltMessage | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| AmpPower | EST_Panel, EST_Card, EST_Priority, EST_Chan |
| AudMsg | EST_Panel, EST_Card, EST_Msg_Index, EST_Priority, EST_Chan |
| Reset | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| PanelSil | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| AlarmSil | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| Drill | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| GAInhibit | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| Reboot | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| Evacuate | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| AltSensitiv | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| MCmsg | EST_Panel, EST_Card, EST_Priority, EST_Account, EST_ConfCL |
| CmdList | EST_Index |
| AndGroup | EST_Index |
| SetDate | EST_Object_Type; refer to Section 6.7 |
| SetTime | EST_Object_Type; refer to Section 6.7 |
| ClrPartitionEvent | EST_Index |
| DeviceTest | EST_Panel, EST_Card, Address |
| SysFunction1 | EST_Panel_Mask(1..8); refer Section 5.3.2 |

⁷ The EST3 panel is only able to send/accept Acknowledgement when the panel is in Proprietary Mode. Contact EST (Edwards Systems Technology) for information on configuring the panel.

| Object Type | Required Parameters |
|--|--|
| SysFunction2 | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| SysFunction3 | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| SysFunction4 | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| CalibrateAnalog | EST_Panel, EST_Card, Address |
| 2StageSounder | EST_Panel, EST_Card, Address, EST_Priority |
| SensorByPass | EST_Panel, EST_Card, Address |
| GasAcceleratedResponse | EST_Panel, EST_Card, Address |
| RemoteReadLock | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| RemoteWriteUnlock | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| LogicalOutput | Address, EST_Priority |
| LampTest2 | EST_Panel_Mask(1..8); refer Section 5.3.2 |
| Enable and Disable Commands (02h and 12h) | |
| Relay | EST_Panel, EST_Card, Address |
| Led | EST_Panel, EST_Card, Address |
| Input | EST_Panel, EST_Card, Address |
| Zone | EST_Index |
| Card | EST_Panel, EST_Card |
| ServGroup | EST_Index |
| AndGroup | EST_Index |
| Matrix | EST_Index |
| TimeCtrl | EST_Index |
| GuardPtrl | EST_Index, EST_Route |
| ChkInGrp | EST_Index |
| AmpPower | EST_Panel, EST_Card |
| InstructionText | EST_Panel, EST_Card, Address |
| MCmsg | EST_Panel, EST_Card, Address |
| CmdList | EST_Index |
| 2StageSounder | EST_Panel, EST_Card, Address |
| LogicalOutput | Address |
| Away and Disarm Commands (01h and 11h) | |
| Partition | EST_Index |

6.7 Set Date and Time To Panel

The following Map Descriptors are required to set the Date and Time of the EST Panel:

First poke month (1-12), day (0-31) and year (yyyy) at offset 1, 2 and 3 then poke 1 at offset 0 to issue SetDate command.

First poke hour (0-23), min (0-59) and sec (0-59) at offset 1, 2 and 3 then poke 1 at offset 0 to issue SetTime command.

| Map_Descriptors | | | | | | |
|---------------------|-----------------|-------------------|----------|-----------|-----------------|--------|
| Map_Descriptor_Name | Data_Array_Name | Data_Array_Offset | Function | Node_Name | EST_Object_Type | Length |
| MD_Set_Date | DA_Set_Date | ,0 | , Wr bx | , EST_1 | , SetDate | , 1 |
| MD_Set_Time | DA_Set_Time | ,0 | , Wr bx | , EST_1 | , SetTime | , 1 |

The following Map Descriptor will enable the FieldServer to synchronize its clock with the EST panel clock:

| Map_Descriptors | | | | | | |
|---------------------|-----------------|-------------------|-----------|-----------|-----------------|--------|
| Map_Descriptor_Name | Data_Array_Name | Data_Array_Offset | Function | Node_Name | EST_Report_Type | Length |
| MD_SLV_TIME | DA_TIME | ,0 | , Passive | , EST_1 | , Date Time | , 6 |

7 Troubleshooting

7.1 Multiple Com Errors

To solve multiple com errors, try adding an IC_Timeout parameter to the Client Side Nodes and set it to 0.5s.

8 Reference

8.1 EST3 Data Format

8.1.1 Input data format

Each input device is associated with a 16-bit value. The contents of the 16 bits are used to generate status types as shown in the table below. Each incoming event is allocated to a status type depending on its device type as shown in the table. It is possible to override this default status type allocation. Refer to **Section 6.5** for more information.

| Type | Encode Value | Alarm | Trouble | Supervisory | Monitor | CO Active | Others |
|-------------------|--------------|-------|---------|-------------|---------|-----------|--------|
| Smoke | 0 | Y | | | | | |
| Pull | 1 | Y | | | | | |
| Heat | 2 | Y | | | | | |
| Waterflow | 3 | Y | | | | | |
| Stagetwo | 4 | Y | | | | | |
| Zone | 5 | Y | | | | | |
| AlarmVerify | 6 | | Y | | | | |
| PreAlarm | 7 | | Y | | | | |
| Security | 8 | | Y | | | | |
| Station | 9 | | | | | | Y |
| Emergency | 10 | | Y | | | | |
| Supervisory | 11 | | | Y | | | |
| Valve | 12 | | | Y | | | |
| GateValve | 13 | | | Y | | | |
| Tamper | 14 | | | Y | | | |
| Temperature | 15 | | | Y | | | |
| Power | 16 | | | Y | | | |
| Signal | 17 | | | Y | | | |
| TroubleOpen | 18 | | Y | | | | |
| TroubleShort | 19 | | Y | | | | |
| LocalTrouble | 20 | | Y | | | | |
| MaintAlert | 21 | | Y | | | | |
| DirtyHead | 22 | | Y | | | | |
| DeviceComm | 23 | | Y | | | | |
| GroundFault | 24 | | Y | | | | |
| InternalTrouble | 25 | | Y | | | | |
| BadType | 26 | | Y | | | | |
| BadPersonality | 27 | | Y | | | | |
| UnexpectedDevice | 28 | | Y | | | | |
| CommonTrouble | 29 | | Y | | | | |
| RelayConfirmation | 30 | | | | | | Y |
| Monitor | 31 | | | | Y | | |
| LocalMonitor | 32 | | | | Y | | |

Additional Information

| Type | Encode Value | Alarm | Trouble | Supervisory | Monitor | CO Active | Others |
|--------------------------|--------------|-------|---------|-------------|---------|-----------|--------|
| Damper | 33 | | | | Y | | |
| Fan | 34 | | | | Y | | |
| Door | 35 | | | | Y | | |
| Switch | 36 | | | | | | Y |
| FirePhone | 37 | | Y | | | | |
| TestEvent | 38 | | | | | | Y |
| DeviceCompatabilityFault | 39 | | | | | | Y |
| LogicAnd | 40 | Y | | | | | |
| LogicMatrix | 41 | Y | | | | | |
| ServiceGroup | 42 | Y | | | | | |
| TimeControl | 43 | | | | | | Y |
| GuardPatrol | 44 | | Y | | | | |
| CheckInGroup | 45 | | | | | | Y |
| <i>Internal use only</i> | 46 | | | | | | Y |
| Disabled | 47 | | | | | | Y |
| <i>Internal use only</i> | 48 | | | | | | Y |
| Instruction Text | 49 | | | | | | Y |
| Object Running | 50 | | | | | | Y |
| Access Trouble | 51 | | Y | | | | |
| AC Fail | 52 | | | | | | Y |
| Interlockfeedback | 53 | | | | Y | | |
| FeedbackFailure | 54 | | Y | | | | |
| CO Alarm | 55 | | | | | Y | |
| CO Supervisory | 56 | | | | | Y | |
| CO Monitor | 57 | | | | | Y | |
| SmokeSupervisory | 58 | | | Y | | | |
| SensorBypass | 59 | | Y | | | | |
| End of Life | 60 | | Y | | | | |
| CO Alarm3 | 61 | | | | | Y | |
| CO Supervisory3 | 62 | | | | | Y | |
| CO Monitor3 | 63 | | | | | Y | |
| Audible | 64 | | Y | | | | |
| Visual | 65 | | Y | | | | |
| SupervisedOutput | 66 | | Y | | | | |
| NonSupervisedOutput | 67 | | Y | | | | |
| CommonAlarmPutput | 68 | | Y | | | | |
| CommonTroubleOutput | 69 | | Y | | | | |
| CommonSupervisoryOutPut | 70 | | Y | | | | |
| CommonMonitorOutput | 71 | | Y | | Y | | |
| LEDOutput | 72 | | | | | | Y |
| AnalogOutput | 73 | | | | | | Y |
| AudioMessage | 74 | | | | | | Y |
| Amplifier | 75 | | | | | | Y |
| Access Output | 76 | | | | | | Y |
| Interlock | 77 | | | | Y | | |
| Control Auxil | 78 | | | | Y | | |
| Genesis Audible Visual | 79 | | | | Y | | |
| Spare | 81-99 | | | | | | Y |
| DeviceInitFault | 100 | | Y | | | | |
| BaseTypeFault | 101 | | Y | | | | |

Additional Information

| Type | Encode Value | Alarm | Trouble | Supervisory | Monitor | CO Active | Others |
|---------------------|--------------|-------|---------|-------------|---------|-----------|--------|
| SensitivityFault | 102 | | Y | | | | |
| Device Config Fault | 103 | | Y | | | | |
| Riser Fault | 104 | | Y | | | | |
| Invalid Address | 105 | | Y | | | | |
| Duplicate Fault | 106 | | Y | | | | |
| Zone Alarm | 107 | Y | | | | | |
| Zone Supervisory | 108 | | | Y | | | |
| Zone Monitor | 109 | | | | Y | | |
| COMBO ALARM | 110 | Y | | | | | |
| HEAT ACTIVE | 111 | Y | | | | | |
| Spare | 112-126 | | | | | | Y |
| Card | 127 | | Y | | | | |
| SecurityAlarm | 128 | | | | | | Y |
| SecurityFault | 129 | | | | | | Y |
| SecurityTamper | 130 | | | | | | Y |
| SecurityMaintenance | 131 | | | | | | Y |
| Spare | 132 | | | | | | Y |
| SecurityDisarmed | 133 | | | | | | Y |
| SecurityExitTimer | 134 | | | | | | Y |
| SecurityEntryTimer | 135 | | | | | | Y |
| SecurityBypassed | 136 | | | | | | Y |
| SecurityStay | 137 | | | | | | Y |
| SecurityAway | 138 | | | | | | Y |
| SecurityStayFail | 139 | | | | | | Y |
| SecurityAwayFail | 140 | | | | | | Y |
| Spare | 141 | | | | | | Y |
| Spare | 142 | | | | | | Y |
| Internal Use only | 143 | | | | | | Y |
| Security Disabled | 144 | | | | | | Y |
| Spare | 145-150 | | | | | | Y |
| CmdList | 151 | | | | | | Y |

8.1.2 Output data format

Each output device is associated with a 16-bit value. This value consists of two byte fields, the command (LSB) and the attribute (MSB).

| FieldServer Data Array Object (16-bit) | |
|--|-----------------|
| Attribute (8-bit) | Command (8-bit) |

These values are provided by the EST panel and are described in the EST3 ECP protocol specification as follows. These values will be put in the Command field.

| Command | Encode Value |
|------------------|--------------|
| Activate / Away | 01h |
| Enable | 02h |
| Restore / Disarm | 11h |
| Disable | 12h |

The attribute byte must be set for writes to Relay, LED outputs and DeviceTest.

For Relays, the attribute values are:

| Attribute (Relay) | Encode Value |
|-------------------|--------------|
| Enable | 2h |
| Activate | 101h |
| Restore | 11h |
| Disable | 12h |

For LED's, the attribute values are:

| Attribute (LED) | Encode Value |
|-----------------|--------------|
| On | 101h |
| Slow Flash | 201h |
| Fast Flash | 301h |
| Disable | 12h |
| Enable | 2h |
| Off | 1h |

For DeviceTest (Signature Devices Only), the attribute values are:

| Attribute (DeviceTest) | Encode Value |
|---|--------------|
| TestActive1 <i>Places the device in its primary active state (Alarm, Monitor, Supervisory, SecurityAlarm, etc.)</i> | 201h |
| TestTrouble <i>Places the device in CommonTrouble</i> | 301h |
| TestActive2 <i>Places security devices capable of tamper, in SecurityTamper Places sensors capable of PreAlarm in Prealarm</i> | 401h |

8.2 EST3 ECP Connection Statistics

The EST3 ECP protocol has two distinct levels:

- A poll-response connection is maintained by the EST panel acting as the master. The bytes transferred in this process are displayed on the FieldServer as SCADA bytes transmitted and received.
- The FieldServer acts as a client by inserting requests into its response messages; the EST panel then inserts the requested data into its subsequent polling messages. The bytes transferred in this process are displayed on the FieldServer as PLC bytes transmitted and received.

The following statistics are available on the Driver Aspects screen when viewing Connection Details (select the EST Connection in Connection Overview, and press space repeatedly to page to this screen):

| Statistic Name | Description |
|------------------|---|
| DLL Rx Char | Data Link Layer Bytes Received |
| DLL Rx Msg | Data Link Layer Messages Received |
| DLL Tx Char | Data Link Layer Bytes Transmitted |
| DLL Tx Msg | Data Link Layer Messages Transmitted |
| DLL Timeouts | Data Link Layer Timeouts |
| DLL IC Timeouts | Data Link Layer Inter-Character Timeouts |
| DLL Streaming | Data Link Layer Streaming Errors |
| DLL Bad Replies | Data Link Layer Bad Replies |
| DLL Link Control | The driver lost communications with the panel (due to panel reset or power-cycle or cable interruption) and is trying to re-establish communications over the communications link or connection |
| Gateway Type | ECP Gateway Type I/II/III |
| Data Rx Char | Data Bytes Received |
| Data Rx Msg | Data Messages Received |
| Data Tx Char | Data Bytes Transmitted |
| Data Tx Msg | Data Messages Transmitted |
| Conn Rx Char | Total Bytes Received on Connection |
| Conn Rx Msg | Total Messages Received on Connection |
| Conn Tx Char | Total Bytes Transmitted on Connection |
| Conn Tx Msg | Total Messages Transmitted on Connection |
| Delta Rx Char | Delta Message Bytes Received |
| Delta Rx Msg | Delta Messages Received |

8.3 Driver Error Messages

| Error Message | Description and Action Required |
|---|---|
| EST3:#01 FYI. For an Old EST3 Panel, Read MD length must be even. | <p>This message will be displayed once if any Map Descriptor in a configuration file has an odd length. Old EST3 Panels (before 2002) simply do not communicate if length is odd.</p> <p>This message can be ignored if it is new EST3 panel. But if it is old or unknown, try changing the Map Descriptor length to an even value before contacting technical support.</p> |
| EST3:#02 Err. Read MD length must > 0 and <= %d | <p>Numbers of addresses to be read per request are limited.</p> <p>Edit configuration file to set Map Descriptor length within specified range.⁸</p> |
| EST3:#03 Err. Write MD must have length = 1 | <p>One Map Descriptor can write only 1 value. Change length to 1.⁸</p> |
| EST3: #04 Unknown Escape Sequence 1B %02X considered as %02X | <p>This message is printed if the FieldServer receives sequences that are not specified. Specified sequences are 1B 82, 1B 8D and 1B 9B. This message is for information only and can be ignored unless the data stored by the FieldServer is invalid in which case, call tech support.</p> |

⁸ Upload the configuration file, make the necessary changes, download to the FieldServer and cycle power to the FieldServer for the changes to take effect.