

## 4. Bitex Utility

The **bitex** utility provides a graphical user interface for the display of status information reported by Built-In Test Equipment (BITE) integrated into the radar and associated systems and reported via the RCP. **Bitex** also allows for operator initiated commands to be sent to these BITE units (again via the RCP).

These features are very useful in that through the graphical user interface of **bitex**, an operator can cause physical functions to take place at the remote radar (i.e. – reset faults, start equipment, switch power systems, etc). Also, button pushes can be decoded by the RCP into control variables which can be further utilized by the RCP in logic equations to make complex functions to take place.

Furthermore, with the RCP, the uncommitted analog and digital inputs of the RCP can be mapped into status variables which in turn can be passed to **bitex** for display as status indicators.

As the **bitex** utility is normally highly integrated with the functioning of the RCP, it is advised to review the *SIGMET RCP02 Users Manual*, especially the appendix on data formats.

### Bitex Details

**Bitex** can handle as many as 96 pieces of data from up to four separate BITE units. For example, the antenna sub-assembly may be one BITE unit, the transmitter a second, the radar controller a third and facility equipment (power equipment, building alarms, etc) a fourth.

Traditionally, all BITE units connect electrically to the Radar Control Processor (RCP) via interfaces such as contact closures, analog voltages, or serial communications. The RCP integrates all of this information and sends it over a serial line to the IRIS for ultimate display in the **bitex** utility. These commands are mingled with the RCP antenna controller commands on the same serial line.

### In this chapter:

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## 4.1 Invoking Bitex

**Bitex** is invoked graphically from either **irisnet**, **utils** or from the **Radar Status Menu**. However, **bitex** can also be invoked from the command line with the following command:

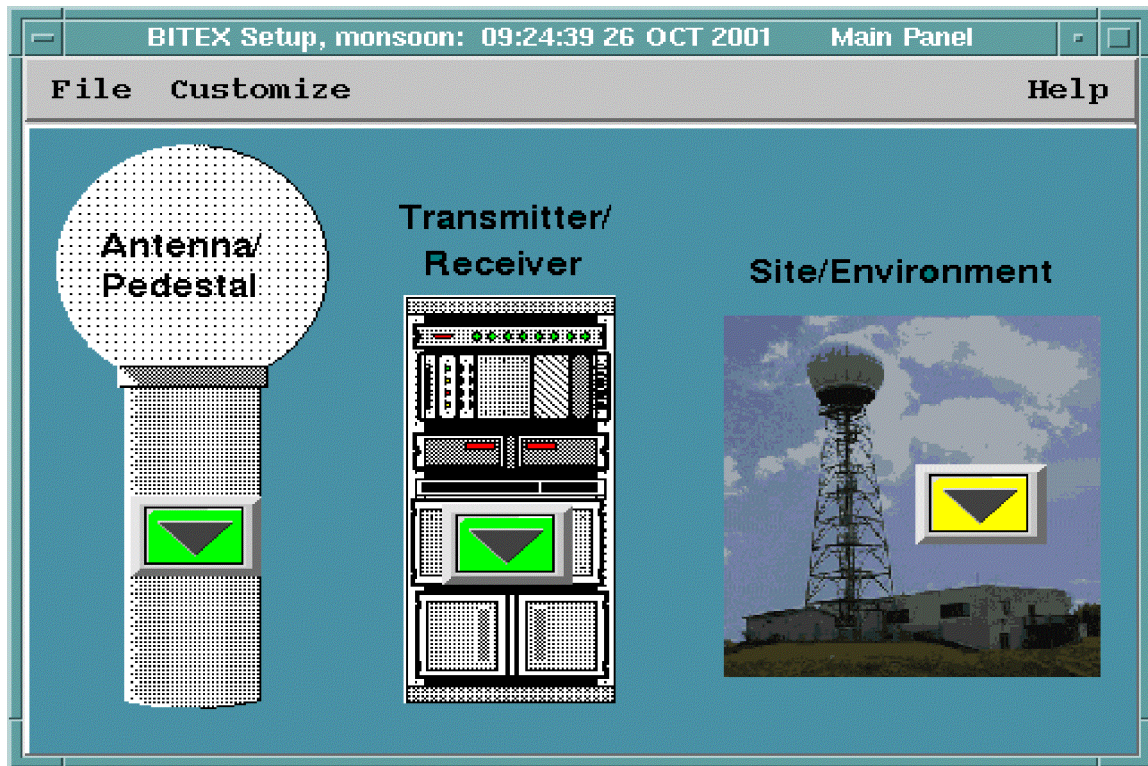
### Command

**bitex**

### Options

- |          |   |
|----------|---|
| -setup   | Lets you customize the BITE menu contents and layout.   |
| -upgrade | Upgrades SIGMET's old format BITE configuration files to the format described in this manual. |

## 4.2 Bitex Window



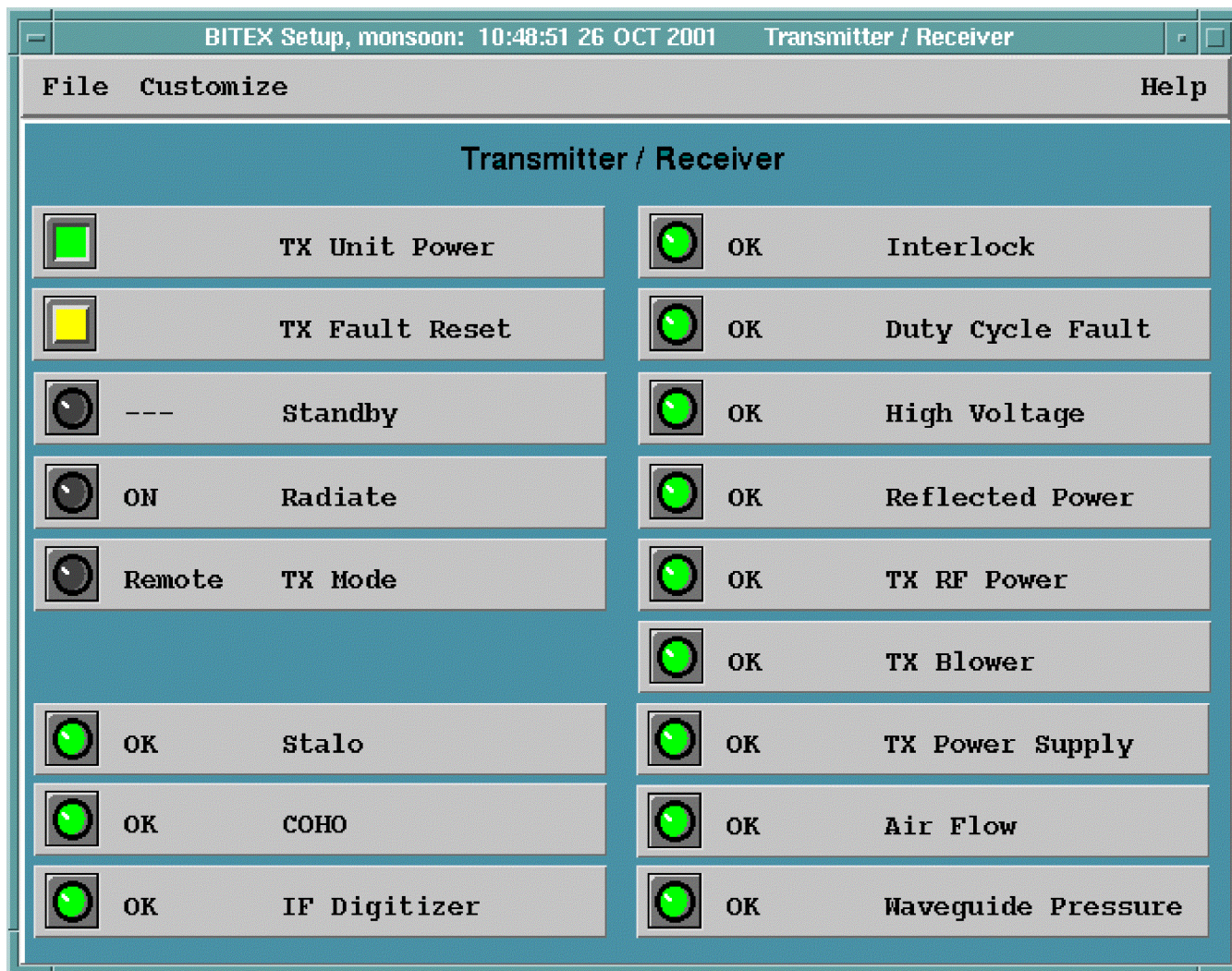
### Main Panel

Upon invoking the **bitex** utility, a window such as the one above is displayed. This is known as the **bitex Main Panel**. The main panel gives the File, Customize and Help buttons on the menu bar, and can (as in this example) give a graphical representation of each Bite Unit.

The main panel and each of the sub panels (discussed below), contain the following graphical components:

- Background Image
- Sub Panel indicators
- BITE graphical data points

Each of these items are discussed in detail in the following sections.



## Sub Panels

**Bitex** may contain **Sub Panels**. In the main panel shown above, there are three sub panels available via the main panel (denoted by the downward pointing arrow graphic). If you click on the sub panel in the transmitter / receiver area, an additional window will appear on the screen as shown here (the Transmitter / Receiver sub panel).

You may have any number of sub panels, including none. However, it is usually most convenient to have a few sub panels accessible from the main panel, where each sub panel represents a different functional area of your radar BITE. Note it is also possible to nest sub panels, such that from one sub panel, you can open other sub panels.

In this sub panel example, there is a simple background image, there are no nested sub panels, and there are 17 graphical data points. Of the 17 graphical data points, two (TX Unit Power and TX Fault Reset) are user input data points and the other 15 are all status output data points.

## 4.3 Bitex Commands

### File

**Save**

**Save** applies the current settings and writes them to disk file called **BITE\_SETUP\_WGT.DAT**. This choice is available only if you invoke **bitex** with the setup option.

**Print**

**Print** creates an X-window dump of the menu you are running, as follows:

**Exit**

- **Print->to Printer** sends the output to the Postscript or color printer specified in the Printer Setup menu.
- **Print->to File** sends the output to a file in your default home directory.
- **Print->Setup** lets you configure the printer on your system. See Section the *SIGMET Installation Manual* for information on configuring a printer.

**Exit** exits from the **bitex** utility.

### Customize

**General...**

Each of the following is a brief description of these controls. Full descriptions are found in following sections. It should be noted that these three options are only available if **bitex** was started in with the **-setup** option.

**Tools...**

**General** accesses the Bitex Customization Menu. This menu allows sets up the serial stream parameters for each BITE unit.

**Panel Options...**

**Tools** accesses the **bitex** tool suite that allow for creating, deleting and positioning of sub panels and data point items.

**Panel Options** allows for the current panel name to be set and allows for the user to specify a background GIF image for this panel.

### Help

**Help**

**Help** accesses this manual.

## 4.4 Customizing of Bitex

If you invoke **bitex** with the **-setup** option, you can customize certain features of **bitex**. These are described briefly above as the **General, Tools and Panel Options**. Complete descriptions of these items follow.

All the customization menus are scratch pads, so changes do not take effect until they are applied. Click the OK button when you have filled in the necessary fields. This applies the changes and closes the menu.

After you make changes, you can save the configuration so that it is used the next time the antenna driver starts. Choose **File→Save** to save the changes. If you choose **File→Exit** and you have not saved your changes, **bitex** asks if you want to save them. Remember that changes do not take effect until you apply them.

### 4.4.1 General – Bitex Customization Options

**BITE Customize Menu**

Number of BITE Units

Unit 1 Action

Unit 1 Hex ID Number  I/O

Unit 1 Byte Count Packet  Age

Unit 2 Action

Unit 2 Hex ID Number  I/O

Unit 2 Byte Count Packet  Age

To display the BITE Configuration menu, choose **Customize→General**. This menu is used to change the format of the BITE packet transmission and reception over the serial communications stream. In normal operation, this menu is not needed. To protect against inadvertent changes, you must be in setup mode to make changes.

### Number of Units

Select from 1 to 4 BITE units. The number of units and the characteristics of each unit displayed in the menu will change reflecting the setting of the Number of Units.

### Unit Action

The choices for Unit Action are **Receiver Status Bits or Transmit Control Bits**. Each of the maximum of four units is configured independently. If the RCP is configured to send status information to IRIS for this unit, the Unit Action in Bitex should be **Receive Status Bits**. Any data point configured for this unit will then display status information.

If the RCP is configured to receive control information from IRIS for this unit, the Unit Action in **bitex** should be **Transmit Control Bits**. Any data point configured for this unit will be a button for sending actions to the RCP.

### Unit Hex ID Number

Each BITE unit has an identification byte (displayed in hex) which determines the meaning of this packet. **Unit IDs** configured in **bitex** should match **Unit IDs** configured on the RCP. Transmit **Unit IDs** are independent of Receive **Unit IDs**, thus they may share the same **Unit IDs** — But within Transmit IDs or Receive IDs, the unit numbers must be unique.

### Unit Byte Count Packet

For each BITE unit, you must specify the number of bytes expected in each packet, from 4 – 20. These numbers must match those configured on the RCP for each BITE unit.

### I/O

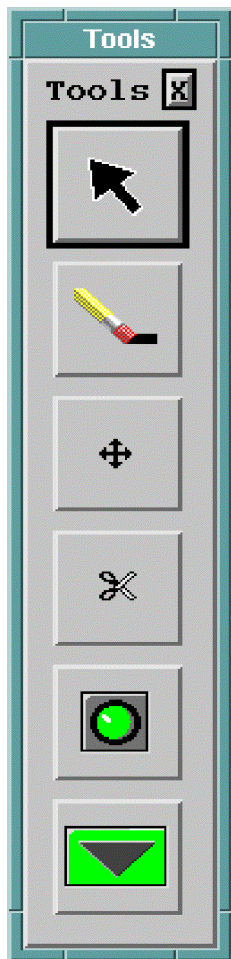
A display-only field showing the number of characters received from or sent to that particular BITE unit.

### Age

A display-only field showing the time in seconds since the last packet for this particular unit was received or transmitted.

## 4.4.2 Bitex Customization Tools

The Bitex Customization tools allow for sub panels and data points to be created, deleted or moved. The tool bar is accessed by choosing **Customize -> Tools...** from any of the bitex panels. Below is a picture of the tool bar and a description of each of the tool items.



Pointer Tool: Exit edit mode.

Erase Tool: Erases the next data point or sub panel.

Move Tool: Click, hold and drag the next data point or sub panel.

Cut / Paste: Cut the next data point or sub panel. When mouse is put over an unoccupied area and click again, pastes the object just cut.

Add Data Point: Add a new data point object to the next clicked position.

Add Sub Panel: Add a new sub panel data object to the next clicked position.

### 4.4.3 Bitex Panel Options



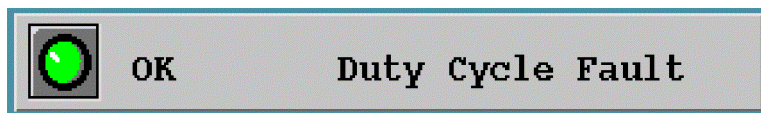
The Bitex Panel Option menu allow two items to be configured:

- Whatever is entered for **Panel Title** will be displayed on the title bar of this panel.
- All panels may optionally have a GIF image to be used as the background. Such an image may be as simple (such as a solid color), or as complex as you like it (such as pictures of cabinets and sub-assemblies, etc). To use a GIF background image, either type in its filename here, or use the selection button to choose an image. The images must be located in the /usr/sigmet/config/images/ directory.

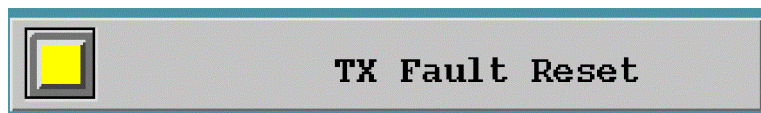
#### 4.4.4 Bitex Data Point Configuration

**Bitex** support two types of data points. There are status data points (information received from the RCP, and control data points (information sent to the RCP).

Graphically, the status data points look like the following:



Graphically, the control data point look like the following:

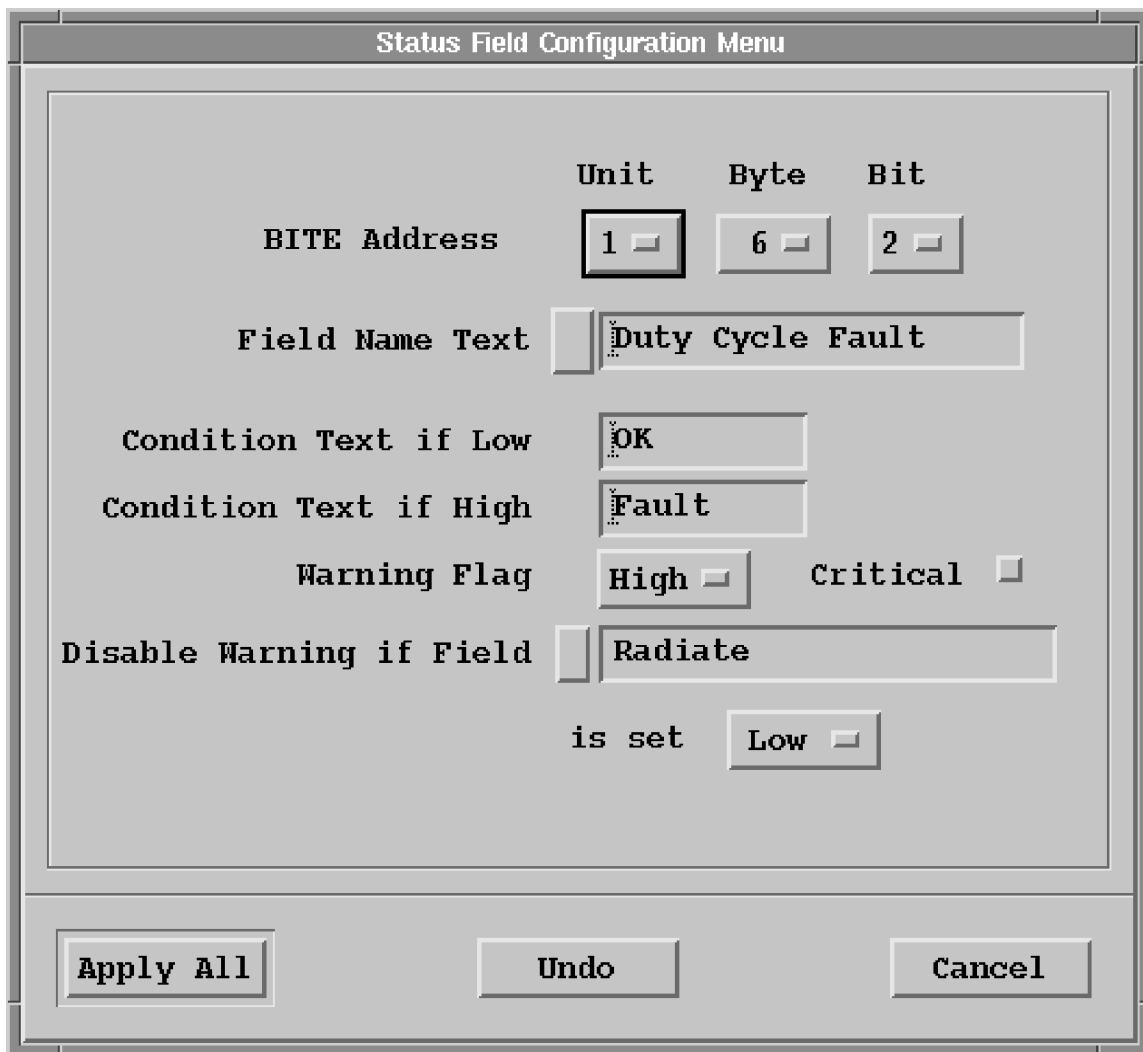


Status data points are passive (accept no user input). They graphically display status information as reported by the RCP.

Control data points are active. They provide the operator with a button that can be pressed or toggled. The status of the button is sent to the RCP. The RCP decodes this uses this state to affect electrical outputs.

#### Configuration of Status Data Points

Status data points are configured by right clicking on the data point (see above). This setup feature is only available if Bitex was started with the **-setup** option. Upon clicking, a the **Status Field Configuration Menu** is displayed:



The image shows a 'Status Field Configuration Menu' dialog box. It contains several configuration options for a status field. At the top, there are three columns: 'Unit', 'Byte', and 'Bit'. Below these, the 'BITE Address' is configured with values 1, 6, and 2. The 'Field Name Text' is 'Duty Cycle Fault'. The 'Condition Text if Low' is 'OK' and 'Condition Text if High' is 'Fault'. The 'Warning Flag' is set to 'High' and 'Critical'. The 'Disable Warning if Field' is 'Radiate' and 'is set' is 'Low'. At the bottom are 'Apply All', 'Undo', and 'Cancel' buttons.

	Unit	Byte	Bit
BITE Address	1	6	2
Field Name Text	Duty Cycle Fault		
Condition Text if Low	OK		
Condition Text if High	Fault		
Warning Flag	High Critical		
Disable Warning if Field	Radiate		
is set	Low		

Apply All Undo Cancel

## BITE Address

The BITE address is used to specify exactly which byte and bit in the BITE packets from the RCP corresponds to this status item. The BITE address has three parts:

- Unit — Corresponds to the one of the “Received Status Bits” Units defined in the Bite Customization Menu.
- Byte — For this Unit, what byte is used for this data point. Limited to a range between 3 and a customized number of bytes (N) minus 1 for this particular Unit (bytes 1, 2 and N are reserved).
- Bit — Corresponds to the exact bit (in the above Unit number and Byte number) that this data point is mapped to. Limited to the range 0 – 6.

## Field Text Name

The text string that appear on this status data point that defines its meaning. This text can be up to 19 characters long. By pressing the button on the left of the field, a pre-defined text string can be chosen. If one of these pre-defined field names is used, this allows the antenna utility to recognize this data point as a “special meaning” data point, and the antenna utility will also display the setting of this data point. Note this is only applicable to system that require an INU (moving platform radars).

## Condition Text if Low / High

These fields allow the display of optional text depending on the reported state of this data point. If entered, this text is displayed on the left side of the actual data point display. This text can be up to nine characters long.

## Warning Flag

Controls fault generation. This can be set to either “None,” “Low,” or “High.” “None” means not to generate a fault based on this bit, otherwise the warning flag indicates the level considered a fault. If a fault is possible, the fault can be further conditioned with the Disable Warning field.

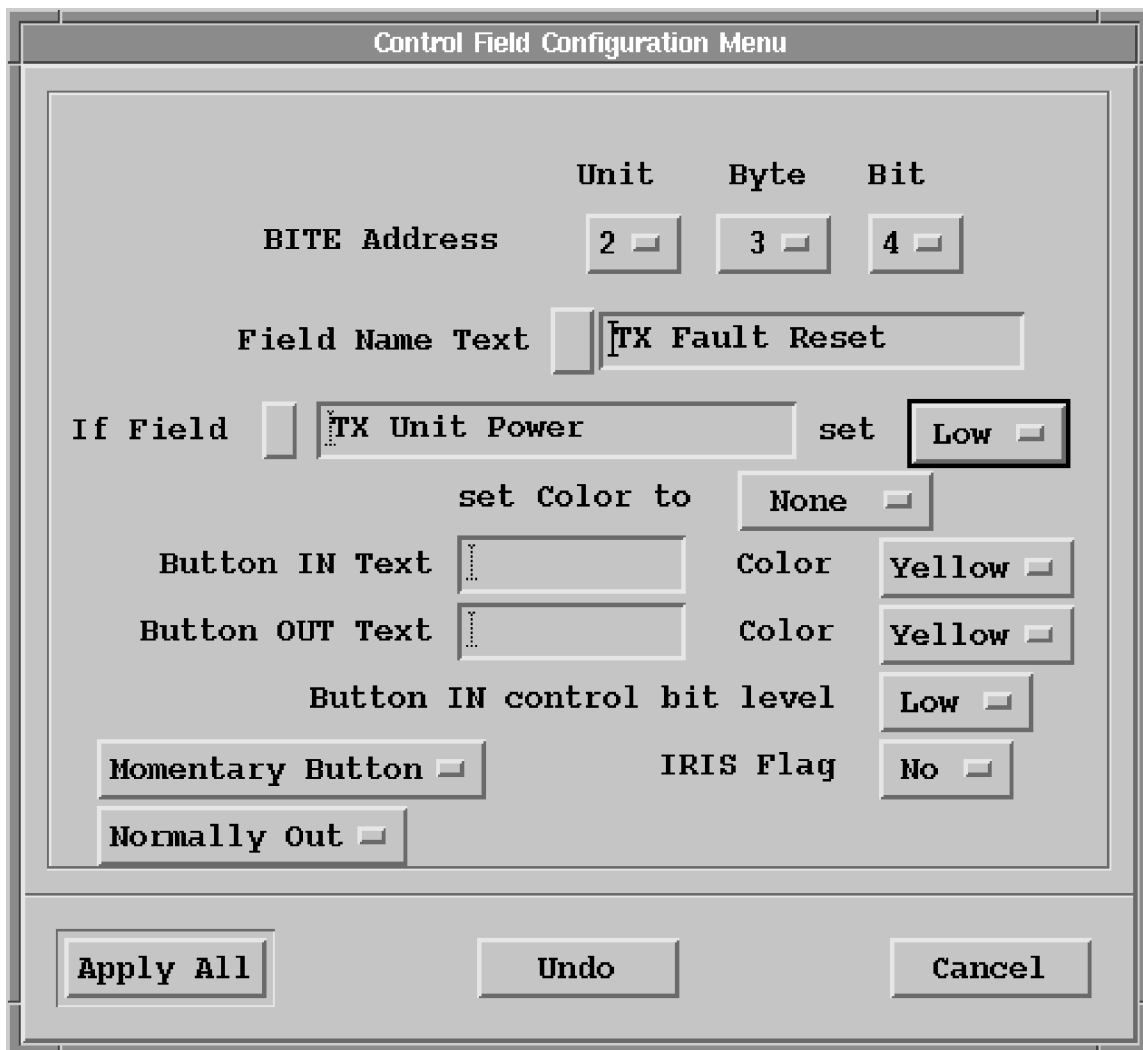
If the warning flag is set (value other than None), then if the data point is in the unfaulted state, it the LED indicator will be displayed as green. If the data point is in the faulted state, the data point will be displayed as either yellow (non-critical), or red (critical) depending on the state of the Critical button (next to the Warning Flag selection). Furthermore, if the warning flag is set to a value other than None, then this data point will be or’ed into the overall status of this site. Thus this data point could cause this site to be considered faulted, or critically faulted. This information can be used by the RCP to allow channel changing in system employing redundancy.

## Disable Warning

Lets you override a warning if a particular field is set to “Low” or “High.” This is used when a condition should generate a warning only some of the time. For example, a “High Voltage Missing” condition does not require a warning if the transmitter is turned off. By specifying this additional BITE condition, you disable the warning.

## Configuration of Control Data Points

Control data points are configured by right clicking on the data point (see above). This setup feature is only available if Bitex was started with the **-setup** option. Upon clicking, a the **Control Field Configuration Menu** is displayed:



The image shows a 'Control Field Configuration Menu' dialog box. It contains several configuration options for a BITE field. At the top, there are three dropdown menus for 'Unit' (set to 2), 'Byte' (set to 3), and 'Bit' (set to 4). Below these is a 'BITE Address' label. The 'Field Name Text' is set to 'TX Fault Reset'. There is a checkbox for 'If Field' which is unchecked, followed by a text field containing 'TX Unit Power' and a 'set' button. To the right of the 'set' button is a dropdown menu for 'Low'. Below this is a 'set Color to' label and a dropdown menu for 'None'. There are two rows for button configuration: 'Button IN Text' and 'Button OUT Text', each with a text field and a 'Color' dropdown menu set to 'Yellow'. Below these is a 'Button IN control bit level' dropdown menu set to 'Low'. At the bottom left, there are two checkboxes: 'Momentary Button' (unchecked) and 'Normally Out' (unchecked). To the right of these is an 'IRIS Flag' dropdown menu set to 'No'. At the very bottom of the dialog are three buttons: 'Apply All', 'Undo', and 'Cancel'.

	Unit	Byte	Bit
BITE Address	2	3	4
Field Name Text	TX Fault Reset		
If Field	<input type="checkbox"/> TX Unit Power set Low		
	set Color to None		
Button IN Text		Color	Yellow
Button OUT Text		Color	Yellow
Button IN control bit level		Low	
Momentary Button	IRIS Flag		No
Normally Out			

Apply All      Undo      Cancel

## BITE Address

The BITE address is used to specify exactly which byte and bit in the BITE packets from the RCP corresponds to this status item. The BITE address has three parts:

- Unit — Corresponds to the one of the “Transmit Control Bits” Units defined in the Bite Customization Menu.
- Byte — For this Unit, what byte is used for this data point. Limited to a range between 3 and a customized number of bytes (N) minus 1 for this particular Unit (bytes 1, 2 and N are reserved).
- Bit — Corresponds to the exact bit (in the above Unit number and Byte number) that this data point is mapped to. Limited to the range 0 – 6.

### **Field Text Name**

The text string that appear on this status data point that defines its meaning. This text can be up to 19 characters long.

### **If Field ...**

The If Field... allows for the button color to change based on some condition. The condition is specified by clicking the button to the right of “If Field” and choosing the conditional data point and to the right of this. This can be either “low” or “high” or “None”. Set this to “None” to disable this feature. Finally, the color that the button changes to is selected to the right of the “set color to” text.

### **Button IN / OUT Text and Color**

This field allow text information to be displayed next to the button depending on of the button is pressed in or out, and furthermore, the color of the button can set depending on its position. In the example, no text is desired, thus this information is blank.

### **Button IN control bit level**

This field sets the polarity of the data bit corresponding to this button. The polarity is dependant on if the button is in or out. This field selects the IN polarity and the OUT polarity is the opposite.

### **Momentary Button / Toggle Button**

Buttons can be configured to be either momentary (you must be applying pressure for the button to stay in) or as toggle buttons. This field provides this selection.

### **Normally Out / Normally In**

This field selects the normal position of the button.

### **IRIS Flag**

This field may be set to either “Yes” or “No”. When set to yes, this causes a message to be sent to IRIS whenever the state of the button changes. This message is put into the message log and status product. Setting the button to No disables this feature.