3

Learning the Features

In this chapter....

Learning the Features

In this section, we will help you to learn and understand the Features of the EZText Panels. Details for using pushbuttons, LEDs, PLC messages, and Local Messages are discussed. We recommend that you read this chapter well before you attempt to configure and use the EZText Panel features and controls. As you proceed through this section, relate the topics discussed with how you will implement your panel.

Regardless of the PLC product type, the concepts discussed here are applicable. DirectLogic PLCs are used in any examples of addressing and ladder logic, but the principles can be applied to any type PLC. Once again, this section is showing "concepts" for using the panel features. For complete DirectLogic examples and other PLC solutions, such as Allen-Bradley, please refer to the PLC manufacturer's manual.

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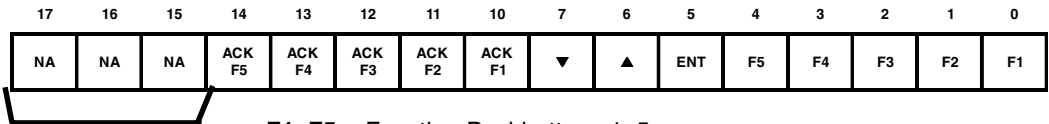- PLC Messages LED
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Memory Mapping/PLC Data Registers

The EZText Panels communicate with the PLC through user-defined PLC data registers. PLC registers are assigned during configuration using the EZText Panel Programming Software. For discrete operations, such as pushbuttons and LEDs, the register bits are accessed by the PLC control program. The following page shows how the pushbuttons and LEDs are assigned to the PLC bit registers.

Pushbuttons

Pushbuttons use one 16-bit register. All bit designations are in octal (0–7 and 10–17), used by DirectLogic PLCs. Use bits 0 through 15 for PLCs using decimal numbering. Address used here must be READ/WRITE.

BUTTONS (BIT WRITE) PLC WORD — (FROM PANEL)

17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
NA	NA	NA	ACK F5	ACK F4	ACK F3	ACK F2	ACK F1	▼	▲	ENT	F5	F4	F3	F2	F1

Please NOTE:
Any unused bit address should not be used in your PLC program. The panel will control the unused bits.

F1–F5 = Function Pushbuttons 1–5
ENT = Enter
▲ ▼ = Arrow UP/DOWN
ACK F1–F5 = Panel acknowledge of PLC button release
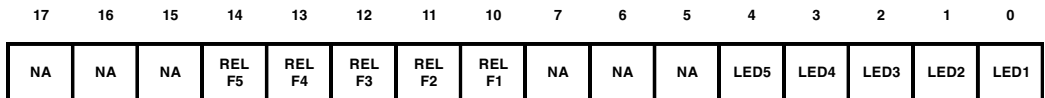**NA** = not used (Do not use for other PLC program addresses)

Bits 0–7 are set when pressing the corresponding button on the panel.

Bits 10–14 are set when the **Panel Set and PLC Release** Option is selected for the corresponding Function Pushbutton and the Release Bit for that button is set by the PLC in the LED (BIT READ) PLC WORD.

LEDs

LEDs use one 16-bit register. All bit designations are in octal (0–7 and 10–17), used by DirectLogic PLCs. Use bits 0 through 15 for PLCs using decimal numbering.

LED (BIT READ) PLC WORD — (TO PANEL)

17	16	15	14	13	12	11	10	7	6	5	4	3	2	1	0
NA	NA	NA	REL F5	REL F4	REL F3	REL F2	REL F1	NA	NA	NA	LED5	LED4	LED3	LED2	LED1

LED1–LED5 = Only used when **By PLC** has been chosen.
REL F1–REL F5 = Used by PLC to release a button that is set by the panel.
NA = not used (Do not use for other PLC program addresses)

Example when using Panel Set & PLC Release Option for a Function Pushbutton:

Operator Presses Button:
F1 is set by the Panel (Bit 0 in Button Word).
This is a maintained pushbutton to the PLC.

PLC Releases Button:
REL F1 is set by the PLC (Bit 10 in LED Word).
The PLC resets the panel button by setting this
bit in the ladder program.

Panel Acknowledge Button Release:
ACK F1 is set by the Panel (Bit 10 in Button Word).
This is the panel acknowledging to the PLC that
*it has reset the button.*

PLC Message Registers
The EZ-220 and EZ-420 panels have 2 or 4 lines of PLC Message display. Each message line references a user-defined register in the PLC. The registers are assigned using the EZText Programming Software. The panel monitors each register for a value (message number) and displays the message associated with the value (i.e., a value of 3 displays message 3).

Embedded Data Registers
Each message can have up to three embedded data values, DATA 1, DATA 2, and DATA 3. Embedded data registers are user-defined.

DATA 1 (16-Bit Register, **READ/WRITE**)
This is a PLC register that contains the first of three possible embedded data values on a line for the message displayed. DATA 1 can be set as a READ/WRITE Register allowing the operator to change a data value. It can also be set to READ ONLY. This is the only data value that has this option.
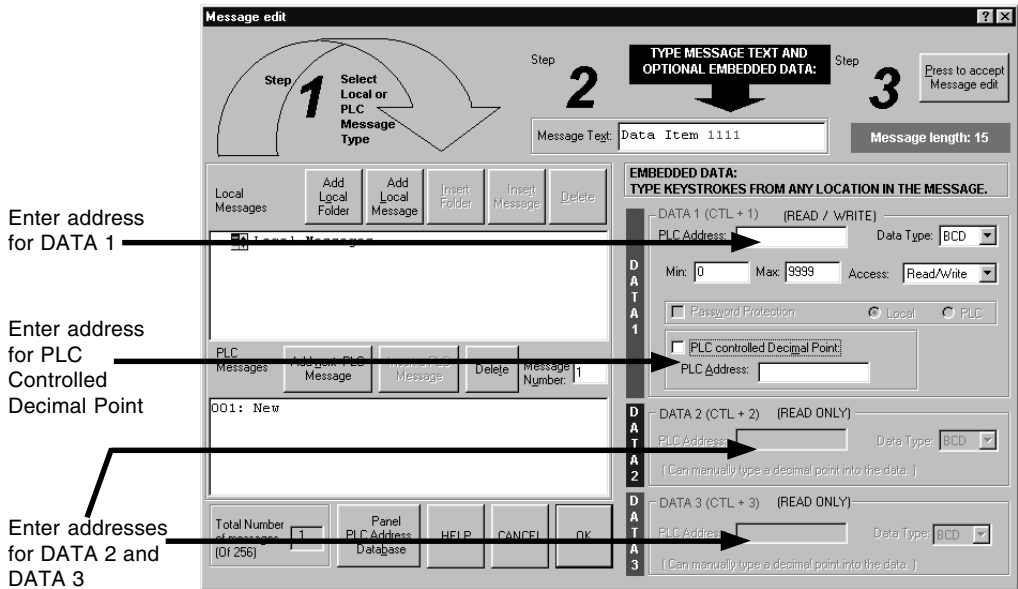
PLC CONTROLLED DECIMAL POINT (16-Bit Register)
This is a register in the PLC for controlling a decimal point within an embedded data value (DATA 1 only). One register holds the value and the other controls the decimal point. The register addresses are assigned from the **Message Edit** screen as shown above. No ASCII characters are allowed in DATA 1 with a PLC controlled decimal point.

DATA 2 (16-Bit Register, **READ ONLY**)
This is a PLC register that contains the second of three possible embedded data values on a line for the message displayed. You may *manually* insert a decimal point. The **PLC Address** and **Data Typ**e are assigned from the **Message Edit** screen, shown above.

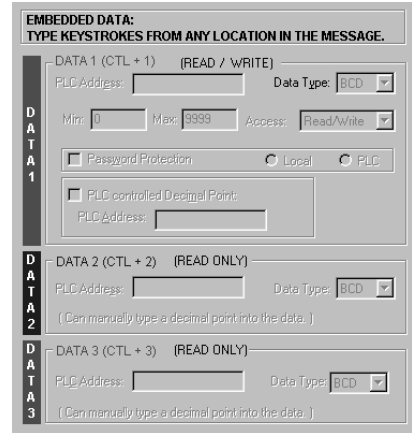**DATA 3** (16-Bit Register, **READ ONLY**)
This is a PLC register that contains the third of three possible embedded data values on a line for the message displayed. You may *manually* insert a decimal point. The **PLC Address** and **Data Typ**e are assigned from the **Message Edit** screen, shown above.

PLC Messages and Local Messages

Embedded Data

The user message contains the ASCII characters and optional embedded data to be displayed. The embedded data can be up to 3 different values — **DATA 1, DATA 2, and DATA 3.**

Special characters in the message determine where the embedded data from the registers should go. When programming, each character for **DATA 1** values will be represent by a "1" for up to five digits. For example, if you want to display a five digit value from the PLC, you will press Ctrl + 1 or F5, five times, and "11111" will display in your message (in red) representing the five digit value.

Please NOTE:
When selecting BCD Data Type, only a 4-digit value can be used (0–9999).

Only **DATA 1**'s embedded value can be **Interactive (READ/WRITE register)**, meaning that data values will display and can be changed from the message. **DATA 2** and **DATA 3** are **Dynamic (READ ONLY register)** meaning that they will display a value, but the value cannot be changed from the message. **DATA 2** values are entered into the message by pressing Ctrl +2 or F6, and are represented by a "2" for each numeric digt, displayed in blue. **DATA 3** values are entered into the message by pressing Ctrl +3 or F7, and are represented by a "3" for each numeric digit, displayed in green. Again, these values can be up to five digits. Data values are only represented by a "1," "2," or "3" when you are programming the message. The actual values will be displayed on the EZText Panel LCD Display window, or will be blank if no value is present. (Password Protection is only available with EZText Panel Model EZ-220P.)

For **DATA 1**, you can select a minimum and maximum range for the embedded data value. The *Maximum* is to test for the upper limit for the data value and *Minimum* is to test for the lower limit for the data value. This will let the user update the value between the ranges. Data values are incremented or decremented with the **UP/DOWN Arrow** Buttons.

Also for **DATA 1**, you can choose to have the Decimal Point in the value controlled by the PLC, or you can manually insert it in the message.

Message Types

There are three types of messages: Static, Dynamic, and Interactive identify the different message types.

Static Messages

Static Messages are text displays that have NO embedded data. The Static Message may be displayed when an event or condition becomes true. You will enter the messages using the EZText Panel Programming Software.
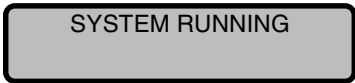
```
    SYSTEM RUNNING
```

Dynamic Messages

Dynamic messages are text messages that include embedded data. These messages are used to display values from the PLC (READ only access to a PLC register). This data is information that helps the operator closely monitor and/or control the machine or process.

```
    Zone1 Temp. : 753
```

Data Value update from PLC register
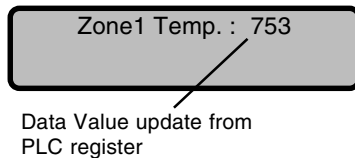
> **Embedded Data Values** in messages can be of two types — BCD or Binary. DATA 1 can have a decimal point controlled by the PLC or manually inserted. DATA 2 and DATA 3 allow you to manually insert a decimal point. The maximum number of data values per message is three. Data type and decimal points are programmed when configuring the message from the Message Edit screen.

Interactive Messages

(With an embedded DATA 1 value, only). An Interactive Message is commonly used for operator data entry. This type of message is used for changing values that are stored in the PLC registers (READ/ WRITE access). These values are typically; Setpoint, Upper and Lower Limits, etc. Interactive Messages may be configured to enter data using the **UP/ DOWN Arrow** buttons.

```
    Enter New Temp. =  300
```

Data value entered by operator
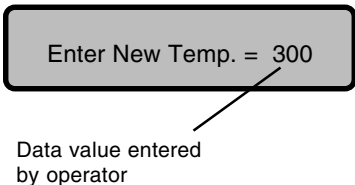
Displaying PLC Messages

PLC Messages are triggered by the PLC. The PLC Message LED will illuminate to let you know that the PLC has generated the message. You cannot press the **esc** key to exit the PLC Message mode until 3 seconds after the message has been triggered. This delay is to ensure that the message has been seen

by the operator. After the 3 seconds, press the **esc** key and you will return to Local Message mode. If you press the **esc** key again, the last PLC Message will be redisplayed.

Static Message Operation
To display a Static PLC message, you simply put the message number (1–256) in the appropriate PLC register. These messages are text only, no embedded data.

Dynamic Message Operation
Dynamic messages are text messages that include embedded data. These messages present the operator with important PLC data. You may program message numbers 1–256 to be used as dynamic messages. Dynamic messages may be displayed on either the top or bottom line. The maximum number of digits that may be displayed is five (if Binary data format or four if BCD). Use the EZText Panel Programming Software to configure Dynamic messages. See Section 7, *Configuration,* for more information.

Interactive Message Operation
An interactive message is a text display that allows operator data entry. Use these messages to enter or change values that are stored in PLC registers. When the interactive message is displayed, the operator can enter data. Check the PLC product user manual to verify which data formats are supported. Depending on the PLC, the data format will be either Binary or BCD (Binary Coded Decimal). Five digits may be entered in a 16-bit register using Binary data format. Four digits may be entered in a 16-bit register using BCD data format.

Interactive messages are configured within the EZText Panel Programming Software by embedding a DATA 1 value in a PLC message. An interactive message requires that you define the Format (Binary or BCD), and Decimal Point Position. There are two types of decimal point placements — PLC controlled and fixed placement (decimal point entered between characters when configuring the message).   A PLC controlled decimal is only allowed in DATA 1. DATA 2 and DATA 3 allow you to enter a fixed point (manually inserted). Two PLC registers are used to store PLC controlled decimal point values, one for the data value and the other for decimal point control. When the decimal point is PLC controlled it must be configured in your PLC logic program. For more information, see Chapter 5, *Configuration,* or your PLC Configuration Manual.

Arrow Adjustment Entry
Arrow adjust is often used when minimum and maximum setpoint ranges are required or a setpoint value requires only minor adjustment. These arrow adjustments are only possible using the **UP** or **DOWN Arrow** pushbuttons. As

you press the **UP** and **DOWN Arrow** pushbuttons, the numeric value will increment (up) or decrement (down) one count at a time. When the UP/DOWN Arrow buttons are used to increment or decrement a value, the cursor is disabled and will not be visible again until you press **enter**, **esc**, or return from an error or PLC message. Also, the longer you hold the key down, the faster the count will increase. When the adjustment is complete, press the **enter** pushbutton, and the value will be placed in the data register for display and the bit is set.

PLC Message LED

The PLC Message LED will illuminate any time a PLC message is being displayed. When you press the **esc** key, after a PLC Message has been displayed, the panel will return to the Local Message mode. To redisplay the PLC Message, press **esc** again.

Displaying Local Messages

In a **Local Message**, the first message (root level) or folder in the hierarchy is displayed on the top line at start up and the following message or folder is displayed on the second line.

A plus (+) is displayed in front of a folder's or subfolder's name if it is closed. If a folder or subfolder is open, a minus (–) is placed in front of the name. Any messages within that folder will be displayed below it.

```
+Local Folder 1
+Local Folder 2

–Local Folder 2
Local Message 2.1
```

Therefore, a folder is limited to 19 characters after the + or -, a message allows 20 characters. (The EZText Programming Software only allows 19 characters for folder text when you are configuring the Local Messages.)

You may use the **UP/DOWN** Arrow buttons to scroll down to the next message in that folder. At the end of the messages for that folder, you can press the **esc** button to move to the previous folder or level.

The **Local Message** menu hierarchy can only extend three levels deep (after the root level) but each folder (level 1 and level 2) may have many subfolders or messages on that level. Folder level 3 may have many messages, but no folders. Messages can contain up to three embedded data values. See the following examples of a menu tree and how it may appear from within the EZText Panel Programming Software and how it may appear on your display.

Local Message File Structure Example

(as seen when configuring messages in the EZText Panel Programming Software)

This is not displayed on the panel

You cannot change this. It is the Root Level. All messages and folders stem from here.

Level 0 (Root Level)

⊟ 🔲 Local Messages

Level 1 → ⊟ 📁 Folder A → **Folder A is allowed multiple Messages and subfolders**

   📄 Message 1

   📄 Message 2

Level 2 → ⊟ 📁 Folder B → **Folder B is allowed multiple Messages and subfolders**

   📄 Message 1

   📄 Message 2

   📄 Message 3

Level 3 → ⊟ 📁 Folder C → **Folder C is only allowed multiple Messages**

   📄 Message 1

   📄 Message 2

   ⊟ 📁 Folder D → **Folder D is only allowed multiple Messages**

   📄 Message 1

   📄 Message 2

   ⊟ 📁 Folder E → **Folder E is allowed multiple Messages and subfolders**

   📄 Message 1

   📄 Message 2

⊟ 📁 Folder F

   ⊟ 📁 Folder G

   ⊟ 📁 Folder H → **Basic Structure**

   📄 Message 1

⊟ 🔲 Local Messages
⊞ 📁 Folder 1
⊞ 📁 Folder 2

"Local Messages" is just a place holder and always appears in the configuration software menu tree.

In this example of the Local Message programming window:

Folder 1 would be displayed on Line 1 of the EZText Panel display,

Folder 2 would be displayed on Line 2 of the display.

A plus (+) is displayed in front of the folder icon 📁 if it is closed. If a folder is open, a minus (–) is placed next to the folder icon 📂, and any message in that folder will be displayed.

Local Message Menu Structure Example

(as would be seen on the EZText Panel Display, except that Levels are indented here to make them easier to see.)

Viewing the menu from the root (*A folder is also counted as a message.*)
>   **Local Messages (Root)**
>>   Message 1 *(Root message)*
>>   Message 2 *(Root message)*
>>   +Folder A *(Folder is closed, but it contains 3 messages and two subfolders with 3 messages each)*
>>   Message 16 *(Root message)*
>>   Message 17 *(Root message)*
>>   +Folder D *(Folder is closed, but it contains 5 messages and one subfolder also with 5 messages)*
>>   Message 29 *(Root message)*

Viewing the menu from open Folder A
>>   –Folder A *(Folder is open and it contains 3 messages and one subfolder with 3 messages)*
>>>   Message 4 *(Folder A message)*
>>>   Message 5 *(Folder A message)*
>>>   +Folder B *(Folder is closed, but is contains 3 messages and one subfolder also
>>>   with 3 messages)*
>>>   Message 14 *(Folder A message)*

Viewing the menu from open Folder B
>>   –Folder B *(Folder is open and it contains 3 messages and one subfolder with 3 messages)*
>>>   Message 7 *(Folder B message)*
>>>   Message 8 *(Folder B message)*
>>>   Message 9 *(Folder B message)*
>>>   +Folder C *(Folder is closed, but it contains 3 messages)*

When a folder is opened, a minus sign "–" appears before the folder name. A "+" sign indicates that the folder is closed.
>   **Local Messages (Root)**
>>   Message 1 *(Root message)*
>>   Message 2 *(Root message)*
>>   –Folder A *(Folder A is open)*
>>>   Message 4 *(Folder A message)*
>>>   Message 5 *(Folder A message)*
>>>>   –Folder B *(Folder B is open and is a subfolder of Folder A)*
>>>>>   Message 7 *(Folder B message)*
>>>>>   Message 8 *(Folder B message)*
>>>>>   Message 9 *(Folder B message)*
>>>>>   –Folder C *(Folder C is open and is a subfolder of Folder B)*
>>>>>>   Message 11 *(Folder C message)*
>>>>>>   Message 12 *(Folder C message)*
>>>>>>   Message 13 *(Folder C message)*
>>>   Message 14 *(Folder A message)*
>>   Message 15 *(Root message)*
>>   Message 16 *(Root message)*
>>   +Folder D *(Folder D is closed)*
>>   Message 29 *(Root message)*

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