

3.1.1 FRONT PANEL

The local operator interface for setpoint entry and monitoring of measured values is through the front panel as shown in the figure below. Control keys are used to select the appropriate message for entering setpoints or displaying measured values. Alarm and status messages are automatically displayed when required. Indicator LEDs provide important status information at all times. An RS232 communications port is also available for uploading or downloading information to the PQM.

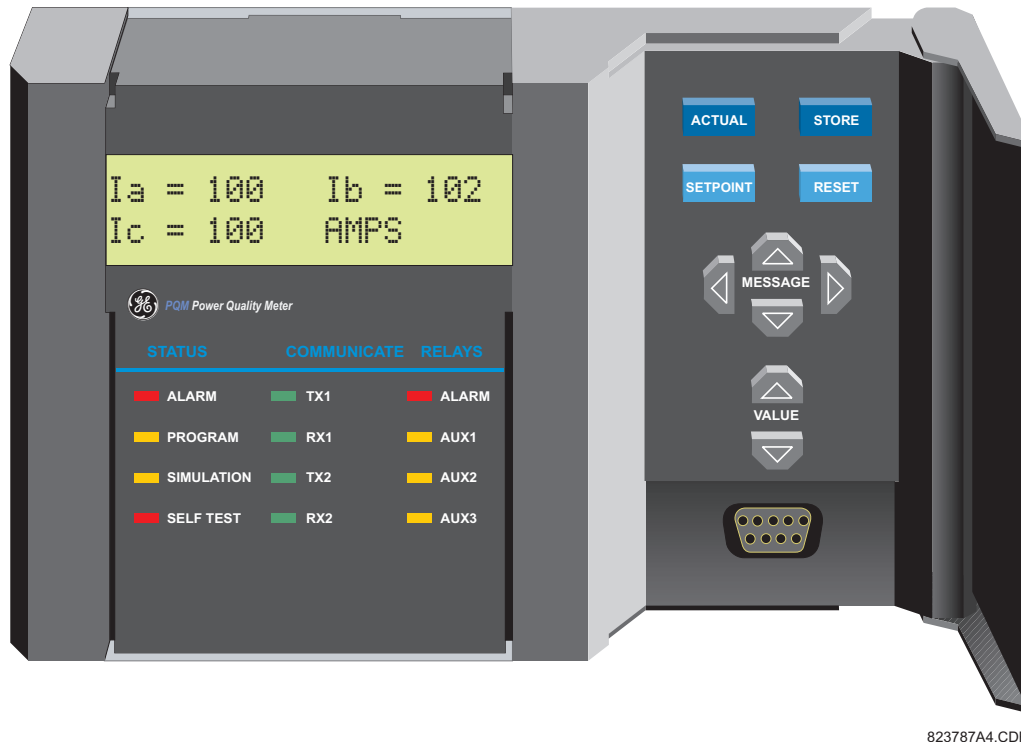


Figure 3-1: FRONT PANEL

3.1.2 DISPLAY

All messages are displayed in English on the 40-character liquid crystal display. This display is visible under varied lighting conditions. When the keypad and display are not actively being used, the screen displays a default status message. This message appears if no key has been pressed for the time programmed in the **S1 PQM SETUP \ PREFERENCES \ DEFAULT MESSAGE TIME** setpoint. Note that alarm condition messages automatically override the default messages.

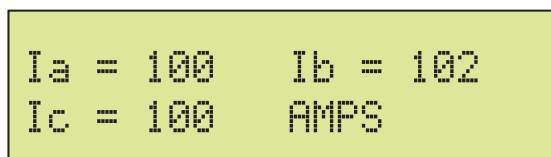


Figure 3-2: DISPLAY

3.2.1 DESCRIPTION

The status indicators provide a quick indication of the overall status of the PQM. These indicators illuminate if an alarm is present, if setpoint access is enabled, if the PQM is in simulation mode, or if there is a problem with the PQM itself.

| STATUS | COMMUNICATE | RELAYS |
|--------------|-------------|---------|
| ■ ALARM | ■ TX1 | ■ ALARM |
| ■ PROGRAM | ■ RX1 | ■ AUX1 |
| ■ SIMULATION | ■ TX2 | ■ AUX2 |
| ■ SELF TEST | ■ RX2 | ■ AUX3 |

Figure 3–3: STATUS INDICATORS

3.2.2 STATUS

- **ALARM:** When an alarm condition exists, the ALARM indicator will be on.
- **PROGRAM:** The PROGRAM indicator will be on when setpoint access is enabled.
- **SIMULATION:** The SIMULATION indicator will be on when the PQM is using simulated values for current, voltage, analog input, switches and analog outputs. While in simulation mode, the PQM will ignore the measured parameters detected at its inputs and will use the simulated values stored in the **S5 TESTING \ SIMULATION** setpoints group.
- **SELF TEST:** Any abnormal condition detected during PQM self-monitoring, such as a hardware failure, causes the SELF TEST indicator to be on. Loss of control power to the PQM also causes the SELF TEST indicator to turn on, indicating that no metering is present.

3.2.3 COMMUNICATE

The COMMUNICATE indicators monitor the status of the RS485 communication ports. When no serial data is being received through the rear serial ports terminals, the RX1/2 indicators are off. This situation occurs if there is no connection, the serial wires become disconnected, or the master computer is inactive. If there is activity on the serial port but the PQM is not receiving valid messages for its internally programmed address, the TX1/2 indicators remain off. This condition can be caused by incorrect message formats (such as baud rate or framing), reversed polarity of the two RS485 twisted-pair connections, or the master not sending the currently programmed PQM address. If the PQM is being periodically addressed with a valid message, the RX1/2 indicator will turn on followed by the TX1/2 indicator.

- **TX1:** The PQM is transmitting information via the COM1 RS485 communications port when lit.
- **RX1:** The PQM is receiving information via the COM1 RS485 communications port when lit.
- **TX2:** The PQM is transmitting information via the COM2 RS485 communications port when lit.
- **RX2:** The PQM is receiving information via the COM2 RS485 communications port when lit.

3.2.4 RELAYS

The status of the output relays is displayed with these indicators.

- **ALARM:** The ALARM relay is intended for general purpose alarm outputs. This indicator is on while the ALARM relay is operating. If the ALARM is programmed as unlatched, this indicator flashes as long as the alarm condition persists. When the condition clears, the ALARM indicator turns off. If the alarm relay has been programmed as latched, the alarm condition can only be cleared by pressing the **RESET** key or by issuing a computer reset command.
- **AUX1:** The AUX 1 relay is intended for control and customer specific requirements. The AUX 1 indicator is on while the AUXILIARY 1 relay is operating.
- **AUX2:** The AUX 2 relay is intended for control and customer specific requirements. The AUX 2 indicator is on while the AUXILIARY 2 relay is operating.
- **AUX3:** The AUX 3 relay is intended for control and customer specific requirements. The AUX 3 indicator is on while the AUXILIARY 3 relay is operating.

3.3.1 DESCRIPTION

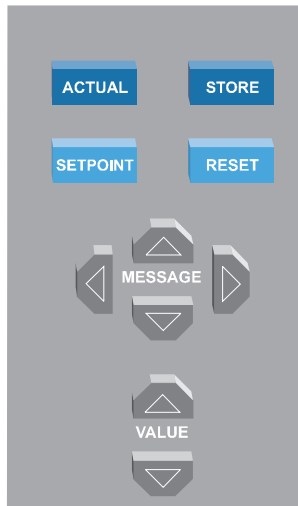






Figure 3–4: FRONT PANEL KEYS



3.3.2 SETPOINT KEY

Setpoints are arranged into groups of related messages called setpoint pages. Each time the **SETPOINT** key is pressed, the display advances to the first message of the next page of setpoints. Pressing **SETPOINT** while in the middle of a setpoints page advances the display to the beginning of the next page. The **MESSAGE**  and **MESSAGE**  keys move between messages within a page.

3.3.3 ACTUAL KEY

Measured values and collected data messages are arranged into groups of related messages called actual values pages. Each time the **ACTUAL** key is pressed, the display advances to the first message of the next page of actual values. Pressing **ACTUAL** while in the middle of a page of actual values advances the display to the beginning of the next page. The **MESSAGE**  and **MESSAGE**  keys move between messages within a page.

3.3.4 STORE KEY

When programming setpoints, enter the new value using the **VALUE**  and **VALUE**  keys, followed by the **STORE** key. Setpoint programming must be enabled for the **STORE** key to store the edited value. An acknowledgment message will flash if the new setpoint is successfully saved in non-volatile memory. The **STORE** key is also used to add and remove user defined default messages. Refer to Section 3.4: DEFAULT MESSAGES on page 3–8 for further details.

3.3.5 RESET KEY

The **RESET** key is used to clear the latched alarm and/or auxiliary conditions. Upon pressing the key, the PQM will perform the appropriate action based on the condition present as shown in the table below.

Table 3–1: RESET KEY ACTIONS

| CONDITION PRESENT | MESSAGE DISPLAYED | PQM ACTION PERFORMED |
|--|--|--|
| None | | No action taken |
| Alarm | RESET NOT POSSIBLE ALARM STILL PRESENT | ALARM indicators and alarm relay remain on because condition is still present |
| Aux Relay | RESET NOT POSSIBLE AUX CONDITION EXISTS | AUXILIARY indicator(s) and aux relay(s) remain on because condition is still present |
| Alarm and Aux Relay | RESET NOT POSSIBLE AUX CONDITION EXISTS | AUXILIARY and ALARM indicators and alarm and aux relays remain on because condition is still present |
| Latched Alarm (condition no longer exists) | | No message displayed, and ALARM indicators and the alarm relay turned off |
| Latched Aux Relay (condition no longer exists) | | No message displayed, and AUXILIARY indicator and the appropriate aux relay(s) turned off |
| Alarm and Latched Aux Relay (Aux condition no longer exists) | | No message displayed, and appropriate AUXILIARY indicator(s) and aux relay(s) turned off |
| Aux Relay and Latched Alarm (alarm condition no longer exists) | | No message displayed, and ALARM indicators and alarm relay turned off |

The **RESET** key, along with the **STORE** key, is also used to remove user defined default messages. Refer to Section 3.4: DEFAULT MESSAGES on page 3–8 for further details.

3.3.6 MESSAGE KEYS

To move between message groups within a page use the MESSAGE ▲ and MESSAGE ▼ keys. The MESSAGE ▼ key moves toward the end of the page and the MESSAGE ▲ key moves toward the beginning of the page. A page header message will appear at the beginning of each page and a page footer message will appear at the end of each page. To select messages within a subgroup press MESSAGE ▶. To back out of the subgroup, press ◀ MESSAGE to access the previous message or MESSAGE ▼ to go to the next subgroup.

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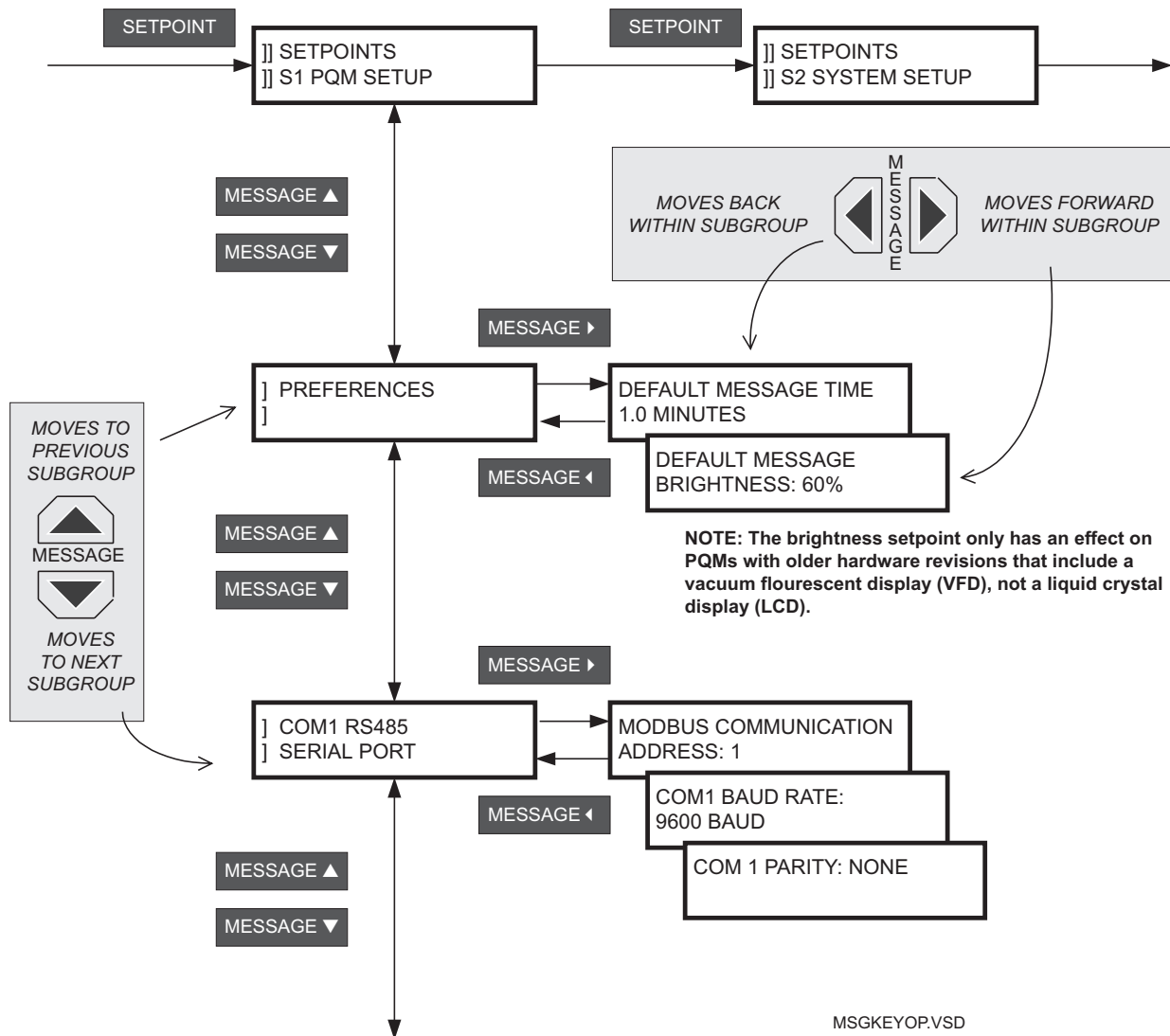


Figure 3–5: MESSAGE KEY OPERATION

3.3.7 VALUE KEYS

Setpoint values are entered using the VALUE ▲ and VALUE ▼ keys. When a setpoint is displayed calling for a yes/no response, each time VALUE ▼ or VALUE ▲ is pressed, the "Yes" becomes a "No," or the "No" becomes a "Yes." Similarly, for multiple choice selections, each time VALUE ▲ or VALUE ▼ is pressed, the next choice is displayed. When numeric values are displayed, each time VALUE ▲ is pressed, the value increases by the step increment, up to the maximum. Hold the key down to rapidly change the value.

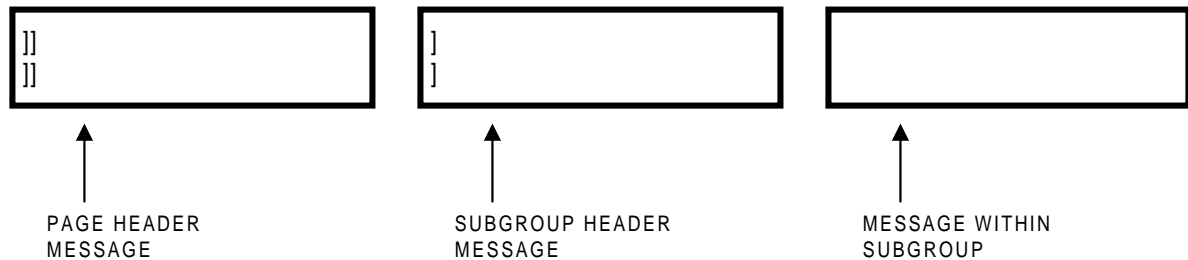
3.3.8 DATA ENTRY METHODS

a) KEYPAD ENTRY

Press the **SETPOINT** key once and the first page of setpoints is displayed. Press **SETPOINT** several times to move to the top of successive pages. A header message with two bars in the first two character positions is the start of a new page. The page number and page title appear on the second line. All setpoint page headers are numbered with an 'S' prefix. Actual value page headers are numbered with an 'A' prefix.

The messages are organized into logical subgroups within each Setpoints and Actual Values page as shown below.

Press the **MESSAGE** / **MESSAGE** key when displaying a subgroup to access messages within that subgroup. Otherwise select the **MESSAGE** **▲** and **MESSAGE** **▼** keys to display the next subgroup.



b) COMPUTER ENTRY

When running PQMPC, setpoint values are grouped together on a screen. The data is organized in a system of menus. See Chapter 6: SOFTWARE for further details.

c) SCADA ENTRY

Details of the complete communication protocol for reading and writing setpoints are given in Chapter 7: MODBUS COMMUNICATIONS. A SCADA system connected to the RS485 terminals can be custom programmed to make use of any of the communication commands for remote setpoint programming, monitoring, and control.

3.3.9 SETPOINT ACCESS SECURITY





The PQM incorporates software security to provide protection against unauthorized setpoint changes. A numeric access code must be entered to program new setpoints using the front panel keys. To enable the setpoint access security feature, the user must enter a value in the range of 1 to 999. The factory default access code is 1. If the switch option is installed in the PQM, a hardware jumper access can be assigned to a switch input. Setpoint access can then only be enabled if the switch input is shorted and the correct software access code entered. Attempts to enter a new setpoint without the electrical connection across the setpoint access terminals or without the correct access code will result in an error message. When setpoint programming is via a computer, no setpoint access jumper is required. If a SCADA system is used for PQM programming, it is up to the programmer to design in appropriate passcode security.

3.4.1 DESCRIPTION

Up to 10 default messages can be selected to display sequentially when the PQM is left unattended. If no keys are pressed for the default message time in the **S1 PQM SETUP \ PREFERENCES \ DEFAULT MESSAGE TIME** setpoint, then the currently displayed message will automatically be overwritten by the first default message. After three seconds, the next default message in the sequence will display if more than one is selected. Alarm messages will override the default message display. Any setpoint or measured value can be selected as a default message.

Messages are displayed in the order they are selected.

3.4.2 ADDING A DEFAULT MESSAGE





Use the **MESSAGE**  and **MESSAGE**  keys to display any setpoint or actual value message to be added to the default message queue and follow the steps shown below. When selecting a setpoint message for display as a default, **do not** modify the value using the **VALUE**  and **VALUE**  keys or the PQM will recognize the **STORE** key as storing a setpoint instead of selecting a default message



ADEFMSG.VSD

If 10 default messages are already selected, the first message is erased and the new message is added to the end of the queue.

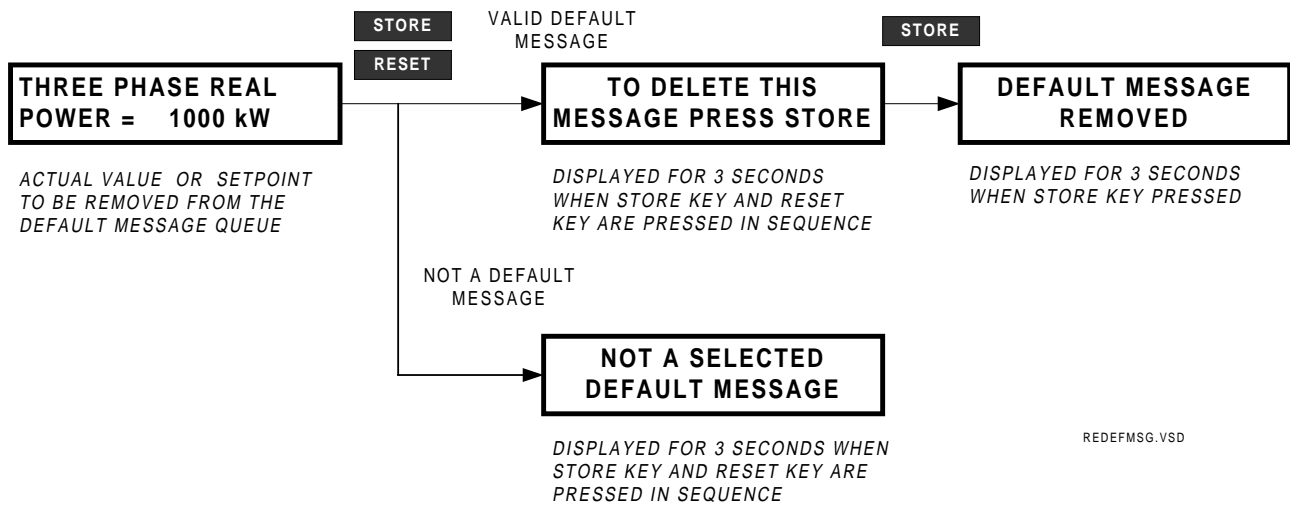
3.4.3 DELETING A DEFAULT MESSAGE

Use the **MESSAGE**  / **MESSAGE**  keys to display the default message to be erased. If default messages are not known, wait until the PQM starts to display them and then write them down. If no default messages have been programmed, the PQM will remain on the current message and the display dims to the level assigned in **S1 PQM SETUP \ PREFERENCES \ DEFAULT MESSAGE BRIGHTNESS** after the **DEFAULT MESSAGE TIME** delay expires. Use the **MESSAGE**  / **MESSAGE**  keys to display the setpoint or actual value message to be deleted from the default message queue and follow the steps below.



NOTE

The **DEFAULT MESSAGE BRIGHTNESS** setpoint is only applicable for PQMs with older hardware revisions that include a vacuum fluorescent display (VFD), not a liquid crystal display (LCD).



Each PQM is pre-programmed with five default messages as shown below. Note, each time the factory set-points are reloaded the user programmed default messages are overwritten with these messages.

The PQM will scroll through the default messages in the sequence shown.

