INTRODUCTION

This is the HART Communicator manual for the EXAxt series of Model AV550G. This manual is described under the HART equipment that is ready to operate.

When using the HART Protocol for the EXAxt AV550G, please refer to the following instruction manuals.

■ Special descriptions in this manual

This manual describes the products and instruction manuals listed below.

Products
AV550G: Averaging converter
Instruction manual
AV550G Instruction Manual: IM 11M12D01-01E

■ Drawings in this manual

Drawings in this manual may be emphasized, abbreviated or partially omitted for easier explanation.

Screen images in this instruction manual are drawings to give you an idea of functions and operation; they may be slightly different from actual screen displays.

■ Other items

The contents of this manual are subject to change without prior notice.
◆ After-sales Warranty

■ Do not modify the product.

■ During the warranty period, for repair under warranty carry or send the local sales representative or service office. Yokogawa will replace or repair any product to the damaged parts and return the product to you.

■ Before returning a product for repair under warranty, provide us with the model name and serial number and a description of the problem. Any diagrams or data explaining the problem would also be appreciated.
  ● If we replace the product with a new one, we won’t provide you with a repair report.
  ● Yokogawa warrants the product for the period stated in the pre-purchase quotation. Yokogawa shall conduct defined warranty service based on its standard. When the customer site is located outside of the service area, a fee for dispatching the maintenance engineer will be charged to the customer.

■ In the following cases, customer will be charged repair fee regardless of warranty period.
  • Failure of components which are out of scope of warranty stated in instruction manual.
  • Failure caused by usage of software, hardware or auxiliary equipment, which Yokogawa Electric did not supply.
  • Failure due to improper or insufficient maintenance by user.
  • Failure due to modification, misuse or outside-of-specifications operation which Yokogawa does not authorize.
  • Failure due to power supply (voltage, frequency) being outside specifications or abnormal.
  • Failure caused by any usage out of scope of recommended usage.
  • Any damage from fire, earthquake, storms and floods, lightning, disturbances, riots, warfare, radiation and other natural changes.

■ Yokogawa does not warrant conformance with the specific application at the user site. Yokogawa will not bear direct/indirect responsibility for damage due to a specific application.

■ Yokogawa Electric will not bear responsibility when the user configures the product into systems or resells the product.

■ Maintenance service and supplying repair parts will be covered for five years after the production ends. For repair for this product, please contact the nearest sales office cited in this instruction manual.
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1. **Operation via HART Communicator**

1.1 **Conditions of Communication Line**

1.1.1 Interconnection between AV550G and HART Communicator

The HART Communicator can interface with the AV550G from the control room, the AV550G site, or any other wiring termination point in the loop, provided there is a minimum load resistance of 250Ω between the connection and the receiving instrument. To communicate, it must be connected in parallel with the AV550G, the connections are non-polarized. Figure 1.1 illustrates the wiring connections for direct interface at the AV550G site. The HART Communicator can be used for remote access from any terminal strip as well.

![Interconnection Diagram](image)

**Figure 1.1 Interconnection Diagram**

1.1.2 Communication Line Requirements

**Specifications for Communication Line:**

- **Load resistance:** 250 to 550Ω (including cable resistance)
  
  When multidrop mode, see Figure 1.2.

- **Minimum cable size:** 24 AWG, (0.51 mm diameter)

- **Cable type:** Single pair shielded or multiple pair with overall shield

- **Maximum twisted-pair length:** 2,000 m

- **Maximum multiple twisted-pair length:** 1,000 m

Use the following formula to determine cable length for a specific application:

\[
L = \frac{65 \times 10^6}{(R \times C)} - \frac{(C_c + 10,000)}{C}
\]

where:

- \(L\) = length in feet or meters
- \(R\) = resistance in ohms, current sense resistance
- \(C\) = cable capacitance in pF/ft or pF/m
- \(C_c = 50,000\) pF
Figure 1.2 Load Resistance and Number of Devices in Multidrop Mode
2. Basic Operation of the HART Communicator (Model 275)

2.1 Keys and Functions

Figure 2.1 HART Communicator

- **Function keys**: Functions of the keys are indicated on the display.
- **Shift keys**: Use to enter alphabetic characters.
- **Alphanumeric keys**: 1. Enter numbers and characters. 2. Select the desired menu item with the corresponding number. (See 2.4 Entering, Setting and Sending Data)

**Example**
- Pressing single key enters the number.
- Pressing the key with shift key enters the alphabetic character.

**Power ON/OFF**

**Communication Cable**

**Function keys**

1. Change the display contents.
2. Move the position where a number or character is to be entered.

**Example**
- Pressing \( \) calls up the display corresponding to the item pointed with the cursor.
- Pressing \( \) returns to the previous display. (See 2.3 Calling up Menu Address.)

**Hot Key**

Call up Hot Key Menu as follows:
1. Ave-a O2 display
2. Ch O2 display
3. Chng Wrt Protect

**Example**
- To enter " 7 ", press 7
- To enter " C ", press C
2.2 Display

The HART Communicator automatically searches for AV550G on the 4 to 20 mA loop when it is turned on. When the HART Communicator is connected to a AV550G, it displays "Online" menu as shown below.

(If AV550G is not found, the communicator displays the message “No Device Found. Press OK...." Press the OK ‘F4’ function key and the main menu appears. Please retry after confirming the connection with the AV550G.)

Figure 2.2 Display

<1> ✅ appears and flashes during communication between the HART Communicator and the AV550G. In Burst mode*, ✅ appears.
<2> The current display menu title appears.
<3> Each item in menu of <2> appears.
<4> ▼ and/or ► appear when the items are scrolled out of the display.
<5> On any given menu, the label appearing above a function key indicates the function of that key in the current menu.

Note: (*) Refer to “3.2.1 Burst Mode”.
2.3 Calling Up Menu Addresses

3.1 Menu Tree shows the configuration of Online Menu which is needed for the operation with HART Communicator. The desired item can be displayed with ease by understanding the menu configuration.

When the HART Communicator is connected to the AV550G, “Online” menu will be displayed after the power is turned on (See Figure 2.2). Call up the desired item as follows:

Key operation

There are two ways to select a desired menu item.

1. Use the or key to select the desired item, and then press the key.
2. Press the number key corresponding to the desired item.

• To return to the previous display, press the key.

If EXIT, ESC and ABORT are displayed, press the desired function Key.

Example: Call up the “Tag” to change the tag number.

Check where “Tag” is located in the menu tree. Then, call up “Tag” on the display according to the menu tree.
<2. Basic Operation of the HART Communicator (Model 275)>

**Display Operation**

1. Display 1 at left appears when the HART communicator is turned on. Select "Device set up".

2. Select "Basic setup".

3. Select "Tag".

4. The display for Tag setting appears. (The default value of "Tag" is blank.)
2.4 Entering, Setting and Sending Data

The data, which are entered with the keys, are set in the HART Communicator by pressing **ENTER (F4)**. Then, by pressing **SEND (F2)**, the data are sent to the AV550G. Note that the data are not set in the AV550G if **SEND (F2)** is not pressed.

All the data set with the HART Communicator are held in memory unless power is turned off, so all data can be sent to the AV550G in one burst.

**Operation**

Entering data on the “**Tag**” setting display.

On alphabetic characters, only capital letters can be used for setting Tag No. with HART Communicator.

**Example:** Set "**FIC-1A**".

Call up “**Tag**” setting display.

1. Device setup ---> 3. basic setup ---> 5. Tag

On the setting display shown above, enter the data as follows:

<table>
<thead>
<tr>
<th>Character to be entered</th>
<th>Operation</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>DEF 8</td>
<td>F</td>
</tr>
<tr>
<td>I</td>
<td>GHI 9</td>
<td>F I</td>
</tr>
<tr>
<td>C</td>
<td>ABC 7</td>
<td>F I C</td>
</tr>
<tr>
<td>-</td>
<td>+ -</td>
<td>F I C -</td>
</tr>
<tr>
<td>1</td>
<td>STU 1</td>
<td>F I C - 1</td>
</tr>
<tr>
<td>A</td>
<td>ABC 7</td>
<td>F I C - 1 A</td>
</tr>
</tbody>
</table>
2. Basic Operation of the HART Communicator (Model 275)

Display

1. AV550G:
   Tag
   HELP | DEL | ESC | ENTER

2. AV550G:
   Basic setup
   Tag: FIC-1A
   2 PV Unit
   3 Xfer fnctn Linear
   HELP | SEND | HOME

3. AV550G:FIC-1A
   Basic setup
   Tag: FIC-1A
   2 PV Unit
   3 Xfer fnctn Linear
   HELP | SAVE | HOME

Operation

1. Press ENTER (F4) to set the data in the HART Communicator after entering the data.

2. Press SEND (F2) to send the data to the AV550G.

3. SEND label changed to SAVE label, and the transmission is completed.
   Press HOME (F3), and return "Online Menu".

SEND is flashing during communication.
3. Parameters

3.1 Menu Tree

Online Menu
1 Device setup
2 PV
3 PV URV
4 PV LRV

1 Process variables
1 PV
2 PV %range
3 PV AO
4 Ave O2

5 Ch O2
1 Ch1 O2
2 Ch2 O2
3 Ch3 O2
4 Ch4 O2
5 Ch5 O2
6 Ch6 O2
7 Ch7 O2
8 Ch8 O2

6 Ave statistics
1 Ave-a statistics
2 Ave-b statistics
3 Ave-c statistics

7 Ch statistics
1 Ch1 statistics
2 Ch2 statistics
3 Ch3 statistics
4 Ch4 statistics
5 Ch5 statistics
6 Ch6 statistics
7 Ch7 statistics
8 Ch8 statistics

continued on the next page.
Online Menu
1 Device setup
   2 PV
   3 PV URV
   4 PV LRV

1 Process variables

8 Indicators

1 Status group 1
   Error
   Hi Hi alarm
   Hi alarm
   Lo alarm
   Lo Lo alarm
   Maintenance
   Calibration
   Range change

2 Status group 2
   Warm up
   Cal gas low
   Indication check
   Blow back
   Proc gas alarm
   Third gas
   Cal alarm
   Inside temp

2 Diag/Service
   1 Loop test
   2 Calibration
   3 Indication check
   4 Blow back
   5 Calib log

   1 Ch1 calib log
   2 Ch2 calib log
   3 Ch3 calib log
   4 Ch4 calib log
   5 Ch5 calib log
   6 Ch6 calib log
   7 Ch7 calib log
   8 Ch8 calib log

   (ditto)

continued on the next page.
Online Menu

1 Device setup
2 PV
3 PV URV
4 PV LRV

3 Basic setup
1 Tag
2 PV Unit
3 Xfer fnctn

4 Detailed setup
1 Control
2 Alarm

1 Error
Ctrl card

Ave-a oxygen
Ave-b oxygen
Ave-c oxygen
Process gas
Cal gas press lo
Inside temp

continued on the next page.
<3. Parameters>

**Online Menu**

1 Device setup  
2 PV  
3 PV URV  
4 PV LRV

5 Review

1 Model  
2 Distributor  
3 PV Snsr unit  
4 PV USL  
5 PV LSL  
6 PV Min span  
7 PV % range  
8 Xfer fnctn  
9 PV Rnge unit  
PV URV  
PV LRV  
PV AO  
PV AO Alrm type  
Snsr s/n  
Write protect  
Manufacturer  
Dev id  
Tag  
Descriptor  
Message  
Date  
Universal rev  
Fld dev rev  
Software rev  
Burst mode  
Burst option  
Poll addr  
Num req preams
3.2 Setting Parameters

3.2.1 Burst Mode

The AV550G continuously sends the data stored in it when burst mode is set “On”. Either one of measured value, % output value, or 4 to 20 mA output value can be selected and sent. The data is sent periodically at 75 ms intervals as a digital signal when the AV550G is set in burst mode. Therefore, communication by the HART simultaneous communicator is also possible.

Setting of Burst Mode

Call up “Burst option” display.


Display

<table>
<thead>
<tr>
<th>AV550G: Burst option</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>F4 (ENTER)</td>
</tr>
<tr>
<td>on</td>
<td></td>
</tr>
</tbody>
</table>

Set data to be sent.
- Measured value (PV)
- % output value (% range/current)
- 4 to 20 mA output value (Process vars /crnt)

Call up “Burst mode” display.

3. HART output → 3. Burst mode

1. AV550G: Burst mode
   Off
   on

Set "On" and press ENTER (F4).

2. AV550G: HART output
   3 ➔ Burst mode

Press SEND (F2).
3.2.2 Multidrop Mode

Field devices in multidrop mode refer to the connection of several field devices on a single communication line. Up to 15 field devices can be connected when set in multidrop mode. To activate multidrop communication, each field device address must be changed to a unique number in the range 1 to 15. This change deactivates the 4 to 20mA output and changes it to 4mA.

Setting of Multidrop Mode

Call up “Poll addr” display.


Display

AV550G: Poll addr

Operation

Set the polling address (a number from 1 to 15) and press ENTER (F4) and then Press SEND (F2).

Call up “Auto Poll” display.


Display

1

Operation

Return “Online Menu” with HOME (F3).

2

Return to “Main Menu” with a “previous” key.

3

Select “Utility”.

HART Communicator

IM 11M12D01-51E
3. Parameters

1. If “Polling” is set to “Never Poll” after the address is set, “Online Menu” cannot be called up and displayed. Be sure to set “Polling” to “Digital Poll” after setting the polling address.

2. When the same polling address is set for two or more field devices in multidrop mode, communication with those field devices is disabled.

Example: Communication when set in the multidrop mode.

**Display**

1. HART Communicator
   - Online
     - ZIA-01A
     - AV550G: ZIA-01A

2. AV550G: ZIA-01A
   - Online
     - PV: 21.64%
     - PV LRV: 21%
     - PV LRV: 0%

3. HART Communicator
   - Offline
     - Frequency Device
     - Utility

**Operation**

1. (1) The HART Communicator searches for field devices is set in multidrop mode when the HART Communicator is turned on.
   - When a HART Communicator is connected to a field device, its tag will be displayed (display 1).

2. (2) Select desired field device. After that, normal communication with the selected field device is possible. However, the communication speed is slow in this case (display 2).

3. (3) To communicate with another field device, call up display 3, and select “Online”.

4. (4) Display 1 will appear. Repeat the above operation.
3-10 <3. Parameters>

Releasing from Multidrop Mode

First, call up the “Poll addr” display, and set the address to 0.
Second, call up the “Polling” display, and set “Never Poll”.

NOTE
If the above releasing method is carried out in the reverse order “Online Menu” cannot be called up.

3.2.3 Software Write Protect

AV550G configured data is saved by the write protect function. Write protect status is set to YES when 8 alphanumerics are entered in the New password field and transferred to the AV550G. In write protect YES status, the averaging converter AV550G does not accept parameter changes. When the 8 alphanumeric string entered in the New password field is also entered in the Enable write field and transferred to the averaging converter, it will be possible to change averaging converter parameters during a 10 minute period.

To change the averaging converter from write protect YES status back to write protect NO status, enter 8 spaces in the New password field after write protect has been released using enable write.

Setting Password

Example: Set the password to 1234

Call up “Chng Wrt Protect” display.

Hot key --> 3.Chng Wrt Protect

<table>
<thead>
<tr>
<th>Display</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Select the “New password”.</td>
</tr>
<tr>
<td>2</td>
<td>Set “1234” and press ENTER (F4).</td>
</tr>
<tr>
<td>3</td>
<td>Reenter “1234” and press ENTER (F4) within 30 seconds.</td>
</tr>
<tr>
<td>4</td>
<td>It changed the state of protection related password.</td>
</tr>
</tbody>
</table>
### Parameters

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Write protect</td>
</tr>
<tr>
<td>2</td>
<td>Enable wrt 10min</td>
</tr>
<tr>
<td>3</td>
<td>New password</td>
</tr>
<tr>
<td>4</td>
<td>Software seal Keep</td>
</tr>
</tbody>
</table>

**SAVE**
Changing Password

Example: To change the password from 1234 to 6789A

Call up “Chng Wrt Protect” display.
Hot key ----> 3.Chng Wrt Protect

<table>
<thead>
<tr>
<th>Display</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 AV550G: Chng wrt Protect 1 Write protect 2 Chng wrt 10min 3 New password 4 Software seal Keep</td>
<td>VWX 2 Select the “Enable wrt 10min”.</td>
</tr>
<tr>
<td>2 AV550G: Enter current password to enable to write for 10 minutes: 1234</td>
<td>“1 2 3 4” F4 (ENTER) Set the old password “1234” and press ENTER (F4).</td>
</tr>
<tr>
<td>3 AV550G: Released the write protection for 10 minutes.</td>
<td>F4 (OK) Press OK (F4).</td>
</tr>
<tr>
<td>4 AV550G: If you want to release completely, you have to change password to all of spaces.</td>
<td>F4 (OK) Press OK (F4).</td>
</tr>
<tr>
<td>5 AV550G: Chng Wrt Protect 1 Write protect 2 Enable wrt 10min 3 New password 4 Software seal Keep</td>
<td>ZY/ 3 Select the “New password”.</td>
</tr>
<tr>
<td>6 AV550G: Enter new password to change state of write protect: 6789A</td>
<td>“6789A” F4 (ENTER) Set new password “6789A” and press ENTER (F4).</td>
</tr>
<tr>
<td>7 AV550G: Re-enter new password within 30 seconds: 6789A</td>
<td>“6789A” F4 (ENTER) Reenter new password “6789A” and press ENTER (F4).</td>
</tr>
</tbody>
</table>
1. Enable wrt 10 min releases write protect status for 10 minutes. While write protect status is released, enter a new password in the New Password field. It will not be possible to set a new password when 10 minutes have elapsed.

2. To release write protect status completely, enter 8 spaces in the New Password field according to the instructions given in Changing the Password. This causes write protect status to change from YES to NO.

"Master password" and "Software Lock"

If you forget the password that has been registered, it is possible to release the mode for 10 minutes by using a master password. Enter YOKOGAWA to release Write protect status for 10 minutes. If this master password is used, the status shown in the parameter “Software seal” is changed from “Keep” to “Break” Press Hot key and select “2 Wrt protect menu”. Current status is shown in “4 Software seal”. This status will be reverted from “Break” to “Keep” by registering a new password.
3.3 Calibration

Here we explain how to execute Semi-Auto Calibration using HART communications. This requires the AV550G Calibration mode to have been set to Semi-Auto or Auto. For further details, refer to “Section 9. Calibration” in the AV550G Instruction Manual.

| NOTE | Calibration-related parameters can not be set remotely using HART communication. Calibration can not be canceled using HART communication. |

Call up “Calibration” display.


<table>
<thead>
<tr>
<th>Display</th>
<th>Operation</th>
</tr>
</thead>
</table>
| 1 AV550G: Select channel.  
1 Ch1  
2 Ch2  
3 Ch3  
4 Ch4  
5 Ch5 | STU 1  
Select Channel to be calibrated (Ch1 in this example). |
| 2 AV550G: You select Ch1. Do you want to execute semi-auto calibration? | F4  
(OK)  
Confirm that you want to execute calibration |
| 3 AV550G: Diag/Service  
1 Loop test  
2 Calibration  
3 Indication check  
4 Blow back  
5 Calib log | HELP | SAVE | HOME  
Calibration is started using parameters (Cal. Time, Hold Time) set in the AV550G |
3.4 Indication Check

Here we explain how to execute a Semi-Auto Indication check using HART communications. This requires the AV550G Indication check mode to have been set to Semi-Auto or Auto. For further details, refer to “Section 10. Indication Check” in the AV550G Instruction Manual.

Indication-Check-related parameters cannot be set remotely using HART communication.
Indication Check cannot be canceled using HART communication.

Call up “Indication check” display.

Display

1. AV550G: Select channel.
   1 Ch1
   2 Ch2
   3 Ch3
   4 Ch4
   5 Ch5

2. AV550G: You select Ch1.
   Do you want to execute semi-auto indication check?

3. AV550G: Diag/Service
   1 Loop test
   2 Calibration
   3 Indication check
   4 Blow back
   5 Calib log

Operation

1. STU 1
   Select Channel for Indication Check
   (Ch1 in this example).

2. F4 (OK)
   Confirm that you want to execute Indication Check

3. Indication Check is started using parameters (Check Time, Hold Time) set in the AV550G
3.5 Blow Back

Here we explain how to execute a Semi-Auto Blow Back using HART communications. This requires the AV550G Blow back mode to have been set to Semi-Auto or Auto. For further details, refer to “Section 10.5 Blow Back” in the AV550G Instruction Manual.

**NOTE**
Blow-Back-related parameters can not be set remotely using HART communication. Blow Back can not be canceled using HART communication.

Call up “Blow back” display.

**Display**

1. AV550G: Do you want to execute blow back?
   - ABORT ON

2. AV550G: Diag/Service
   - 1 Loop test
   - 2 Calibration
   - 3 Indication check
   - 4 Blow back
   - HELP SAVE HOME

**Operation**

Confirm that you want to execute Blow Back

F4 (OK)

Blow Back is started using parameters (Blow Back Time, Hold Time) set in the AV550G.
3. Parameters

3.6 Self-Diagnostics

Here we explain how to check Error or Alarm messages from the AV550G using a HART Communicator. The table below shows the correspondence between error and alarm messages displayed on the HART Communicator and corresponding error and alarm messages in the AV550G. For more details about these error and alarm messages, and troubleshooting procedures, refer to “Section 12. Troubleshooting” in the AV550G Instruction Manual.

3.6.1 Control Card Self-Diagnostics

Call up “Detailed setup” display.

1. Device setup ---> 4. Detailed setup

<table>
<thead>
<tr>
<th>Display</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AV550G: Detailed setup</td>
</tr>
<tr>
<td></td>
<td>1. Control</td>
</tr>
<tr>
<td></td>
<td>2. Channels</td>
</tr>
<tr>
<td></td>
<td>3. Channel status</td>
</tr>
<tr>
<td></td>
<td>4. Output condition</td>
</tr>
<tr>
<td></td>
<td>5. Device information</td>
</tr>
<tr>
<td></td>
<td>SAVE HOME</td>
</tr>
<tr>
<td></td>
<td>STU 1</td>
</tr>
<tr>
<td></td>
<td>Select “Control”</td>
</tr>
</tbody>
</table>

| 2       | AV550G: Control |
|         | 1. Error |
|         | 2. Alarm |
|         | SAVE HOME |
|         | STU 1 |
|         | Select “Error” |

| 3       | AV550G: Error |
|         | Ctrl card OFF |
|         | HELP ON SAVE HOME |

| 4       | AV550G: Control |
|         | 1. Error |
|         | 2. Alarm |
|         | SAVE HOME |

| 5       | AV550G: Alarm |
|         | Ave-a oxygen ON |
|         | Ave-b oxygen OFF |
|         | Ave-c oxygen OFF |
|         | Process gas OFF |
|         | Cal gas press lo OFF |
|         | HELP EXIT |

If OFF is displayed (at right) then there are no errors.
Revert to Error/Alarm screen.

Select “Alarm”

If OFF is displayed (at right) then there are no alarms.
In the display at left, an Ave-a Oxygen Concentration Alarm has occurred.
3.6.2 Channel Card Self-Diagnostics

Call up “Detailed setup” display.

1. Device setup ---> 4. Detailed setup

<table>
<thead>
<tr>
<th>Display</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 AV550G: Detailed setup 1 Control 2 Channels 3 Channel status 4 Output condition 5 Device information</td>
<td>VWX 2 Select “Channels ”</td>
</tr>
<tr>
<td>2 AV550G: Channels 1 Ch1 detailed setup 2 Ch2 detailed setup 3 Ch3 detailed setup 4 Ch4 detailed setup 5 Ch5 detailed setup</td>
<td>STU 1 Select “Ch1 detailed setup” (this example shows how to display Self-Diagnostics for Channel 1).</td>
</tr>
<tr>
<td>3 AV550G: Ch1 detailed setup 1 Ch1 status 2 Sensors 3 Error 4 Alarm</td>
<td>YZ 3 Select “Error ”</td>
</tr>
<tr>
<td>4 AV550G: Error 1 Cell voltage OFF 2 Heater temp ON 3 Ch card OFF 4 Card comm OFF</td>
<td>EXIT If OFF is displayed (at right) then there are no errors. In this example, a “Heater temp” alarm has occurred. Revert to Error/Alarm screen.</td>
</tr>
<tr>
<td>5 AV550G: Ch1 detailed setup 1 Ch1 status 2 Sensors 3 Error 4 Alarm</td>
<td>JKL 4 Select “Alarm”</td>
</tr>
<tr>
<td>6 AV550G: Alarm 1 Oxygen ON 2 Zero conc ratio OFF 3 Span conc ratio OFF 4 Cal time over OFF 5 CJ temp OFF</td>
<td>HELP EXIT If OFF is displayed (at right) then there are no alarms. In the display at left, an Oxygen concentration alarm has occurred.</td>
</tr>
</tbody>
</table>
### Table 3.1 AV550G Alarms and Errors displayed on HART Communicator

<table>
<thead>
<tr>
<th>Control card</th>
<th>HART Communicator Display</th>
<th>Explanation</th>
<th>AV550G display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ave-a oxygen</td>
<td>Ave-a oxygen concentration outside alarm limits</td>
<td>Alarm 1</td>
<td></td>
</tr>
<tr>
<td>Ave-b oxygen</td>
<td>Ave-b oxygen concentration outside alarm limits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ave-c oxygen</td>
<td>Ave-c oxygen concentration outside alarm limits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process gas</td>
<td>Process gas alarm contact signal received by AV550G</td>
<td>Alarm 6</td>
<td></td>
</tr>
<tr>
<td>Cal gas press lo</td>
<td>Cal gas press lo alarm contact signal received by AV550G</td>
<td>Alarm 7</td>
<td></td>
</tr>
<tr>
<td>Inside temp</td>
<td>AV550G case internal temperature over alarm limit</td>
<td>Alarm 9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Channel card</th>
<th>HART Communicator Display</th>
<th>Explanation</th>
<th>AV550G display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell voltage</td>
<td>Cell emf abnormal</td>
<td>Error 1</td>
<td></td>
</tr>
<tr>
<td>Heater temp</td>
<td>Heater temperature abnormal</td>
<td>Error 2</td>
<td></td>
</tr>
<tr>
<td>Ch card</td>
<td>Channel card abnormality detected</td>
<td>Error 3</td>
<td></td>
</tr>
<tr>
<td>Card comm.</td>
<td>Communications between control card and channel card abnormal</td>
<td>Error 5</td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>Channel oxygen concentration outside alarm limits</td>
<td>Alarm 1</td>
<td></td>
</tr>
<tr>
<td>Zero conc. ratio</td>
<td>Zero correction factor outside normal range</td>
<td>Alarm 2</td>
<td></td>
</tr>
<tr>
<td>Span conc. ratio</td>
<td>Span correction factor outside normal range</td>
<td>Alarm 3</td>
<td></td>
</tr>
<tr>
<td>Cal time over</td>
<td>Cell emf didn't stabilize during calibration interval</td>
<td>Alarm 4</td>
<td></td>
</tr>
<tr>
<td>CJ temp</td>
<td>Cold (reference) junction temp. outside normal range</td>
<td>Alarm 5</td>
<td></td>
</tr>
<tr>
<td>Asymmetry alarm</td>
<td>Abnormal change in asymmetry correction factor</td>
<td>Alarm 8</td>
<td></td>
</tr>
</tbody>
</table>
### 3.7 Status Check

You can check Channel Card Status using the HART Communicator. The meanings of these status indications are displayed in the table below.

Call up "Detailed setup" display.

1. Device setup --> 4. Detailed setup

**Table 3.2 HART Communicator Display and Channel Card Status**

<table>
<thead>
<tr>
<th>HART Communicator status display</th>
<th>Channel card status</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Card is Not Installed</td>
</tr>
<tr>
<td>Disable</td>
<td>Channel is disabled</td>
</tr>
<tr>
<td>Warm up</td>
<td>Channel is in Warm Up status</td>
</tr>
<tr>
<td>Measuring</td>
<td>Channel is in Measurement status</td>
</tr>
<tr>
<td>Blow back</td>
<td>Channel is in Blow Back status</td>
</tr>
<tr>
<td>Cal</td>
<td>Channel is in Calibration status</td>
</tr>
<tr>
<td>Ind. check</td>
<td>Channel is in Indication Check status</td>
</tr>
<tr>
<td>Error</td>
<td>Channel is in Error status</td>
</tr>
<tr>
<td>Proc gas</td>
<td>Process Gas alarm has occurred.</td>
</tr>
</tbody>
</table>
4. Maintenance

Various sensor data can be viewed on the HART Communicator.

For more details, refer to “Section 10.1 Display” in the AV550G Instruction Manual.

Call up “Channels” display.


Table 4.1 Meaning of Data Labels in “Sensors”

<table>
<thead>
<tr>
<th>HART Communicator display</th>
<th>Meaning of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell mV</td>
<td>Cell emf displayed</td>
</tr>
<tr>
<td>Cell temp</td>
<td>Cell temperature is displayed</td>
</tr>
<tr>
<td>CJ temp</td>
<td>Cold junction (reference junction) temperature is displayed</td>
</tr>
<tr>
<td>TC volt</td>
<td>Thermocouple emf is displayed</td>
</tr>
<tr>
<td>CJ val</td>
<td>Cold junction (reference junction) resistance is displayed</td>
</tr>
<tr>
<td>Heater duty</td>
<td>Heater duty cycle ON time is displayed</td>
</tr>
</tbody>
</table>
Revision Information

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