GE Measurement & Control

Druck DPI 620 Genii
Advanced Modular Calibrator

Contents

1 Overview

The Druck DPI620 Genii is a battery-powered instrument for electrical measure and source operations and HART® communications. The Druck DPI620 Genii also supplies the power and user interface functions for all optional items. The touch-screen displays up to six different parameters

1.1 Equipment in the Box

The following items are supplied with the Druck DPI 620 Genii:

- DC power supply/battery charger unit
- Li-polymer battery
- Set of six test leads
- AC Probe
- Quick Start Guide
- Stylus

1.2 Optional Items

The items that follow are optional items which can be used with the Druck DPI 620 Genii:

- **Pressure Module Carrier, MC 620**, this attaches directly to the Druck DPI 620 Genii to make a fully integrated pressure instrument

- **Pressure Module, PM 620**, this attaches to the pressure module carrier (MC 620) or a Pressure Station (PV 62X) to enhance the pressure measurement functionality

- **Pressure Stations, PV 62X**, if the Druck DPI 620 Genii is installed in a Pressure Station, it becomes a fully integrated pressure calibrator

1.3 Observance of the User Manual

This manual contains safety and battery installation information for the Druck DPI 620 Genii. It is the responsibility of the customer, to make sure that all personnel operating and maintaining the equipment are correctly trained and qualified. Before operating or using the equipment read and obey all sections including all WARNINGS and CAUTIONS given in the Quick Start Guide

1.4 General Safety Precautions

Read and obey all the operator's local Health and Safety regulations and Safe Working Procedures or Practices. When doing a procedure or task:

- Use only the approved tools, consumable materials and spares to operate and maintain the equipment
- Read and obey all applicable WARNING signs. Make sure that:
- All work areas are clean and clear of unwanted tools, equipment and materials
- All unwanted consumable materials are discarded in accordance with local health and safety and environmental regulations

1.5 General Warnings

- It is dangerous to ignore the specified limits for the instrument or its related accessories. This can cause injuries.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired
- Do not use the instrument in locations with explosive gas, vapour or dust. There is a risk of an explosion
- Make sure all equipment is serviceable
- Use equipment only for the purpose for which it is provided
- Wear all applicable Personal Protective Equipment (PPE)
- Do not use sharp objects on the touch-screen

1.6 Electrical warnings

- The DC input to the DPI620 Genii is rated at 5V (+/-5%) 2 Amps

- To prevent electrical shocks or damage to the instrument, do not connect more than 30V CAT I between the terminals, or between the terminals and the ground (earth)

- External circuits should have appropriate insulation to the mains

- To prevent electrical shocks, use only the GE specified AC probe (Part: IO620-AC) to measure AC voltages that are more than 20 Vrms. Do not connect more than 300V CAT II between the IO620-AC leads, or between the leads and the ground (earth). Attach it to the specified connections only

- This instrument uses a Lithium-Polymer (Li-Polymer) battery pack. To prevent an explosion or fire, do not short circuit, do not disassemble, and keep it safe from damage

- To prevent an explosion or fire, use only the GE specified battery (Part: 191-356), power supply (Part: 191-339) and battery charger (Part: IO620-CHARGER)

- To prevent battery leakage or heat generation, only use the battery charger and power supply in the temperature range 0°C to 40°C (32°C to 104°F
- The power supply input range is 100 – 240Vac, 50 to 60Hz, 250mA, installation category CAT I
- Position the power supply so not to obstruct the supply disconnecting device.
- Note that the operating and storage temperature range of the mains PSU does not match that of the DPI620. Mains PSU operating temperature range 0°C to +40°C, storage temperature range -40°C to +70°C
- To make sure the display shows the correct data, disconnect the test leads before power is set to on or changing to another measure or source function
- Make sure the power is OFF before connecting or disconnecting the probe
- Keep the probe and leads free from all contaminants

The following summary of installation and measurement overvoltage categories are derived from IEC61010-1. The overvoltage categories indicate the severity of overvoltage transients

Overvoltage Category	***Description***
CAT I	*Overvoltage category I has the least severe overvoltage transients. Generally CAT I equipment is not designed to be directly connected to the mains supply. Examples of CAT I equipment are process loop powered devices*
CAT II	*Overvoltage category II describes an electrical installation where typically single phase equipment is connected. Examples of such equipment are appliances and portable tools*

1.7 Pressure Warnings

- Some liquid and gas mixtures are dangerous. This includes mixtures that occur because of contamination. Make sure that the equipment is safe to use with the necessary media

- To prevent a dangerous release of pressure, isolate and bleed the system before disconnecting a pressure connection

- To prevent a dangerous release of pressure, make sure that all the related pipes, hoses and equipment have the correct pressure rating, are safe to use and are correctly attached

- To prevent damage to the Druck DPI 620 Genii, only use it within the specified pressure limits

- Do not exceed the maximum pressures stated in the appropriate component manual for the unit under test

- Reduce pressure at a controlled rate when venting to atmosphere

- Carefully de-pressurize all pipes to atmospheric pressure before disconnecting and connecting to the unit under test

- Observe absolute cleanliness when using the instrument
- Severe damage can be caused if equipment connected to this instrument is contaminated
- Connect only clean equipment to the instrument. To avoid any contamination, an external filter is recommended

1.8 Preparing the Instrument

On receipt of the instrument check the contents in the box, listed in 1.1. It is recommended to retain the box and packaging for future use

1.9 Packaging for Storage or Transportation

To store the unit or to return the unit for calibration or repair carry out the following procedures:

1. Pack the Instrument
2. To return the instrument for calibration or repair, complete the return goods procedure (Ref: 1.17)
3. Return the instrument to the manufacturer or an approved service agent for all repairs

1.9.1 Environment

The following conditions apply for both shipping and storage:

Temperature Range -20° to +70°C (-40° to +158°F)

Altitude Up to 15,000 feet (4,570 metres)

1.10 Install the Battery

1. Remove the five Pozidriv screws (**A**) (Ref: Figure 1-1)
2. Remove the battery cover
3. Check the connections on the battery line up with the connections in the battery compartment
4. Place the battery in the battery compartment
5. Replace the battery cover
6. Secure the cover with the five Pozidriv screws

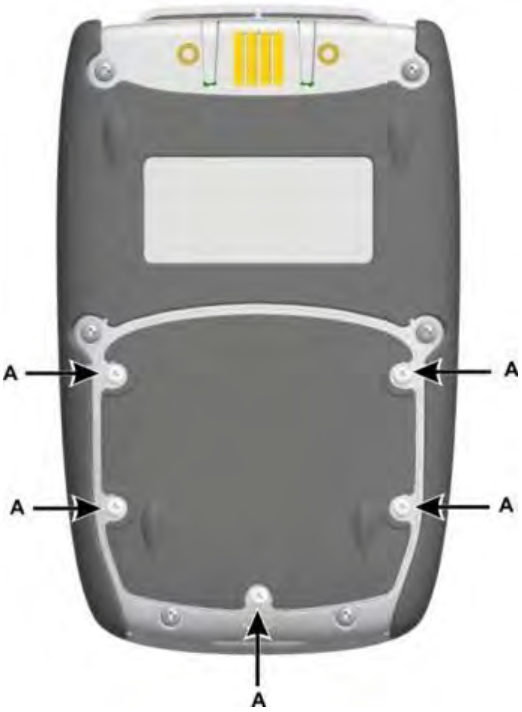


Figure 1-1

1.11 Charge the Battery

1. Connect the DC power supply/battery charger unit in to the +5V DC connection on the side of the unit (Ref: Figure 1-2)
2. The battery can also be charged using the USB connections (Ref: Figure 1-2)
3. The unit can be On or Off when charging. Charging times maybe longer if charging when the unit is on

1.11.1 Battery Charging Times

Charging Connection	**Charge Time**
DC Power Supply	6.5 hours
External Battery Charger	6.5 Hours

1.12 Basic Modes

1.12.1 Power On

From OFF – momentarily press the power button until the display flashes (Ref: Figure 1-2)

1.12.2 Power Off

Press and hold power button until the screen is blank

1.12.3 Sleep Mode

Press and release power button for sleep mode

1.12.4 Power up from Sleep Mode

Ref: 1.12.1 Power On

When powered-up from sleep mode the instrument always opens the last screen shown before going into sleep mode

1.12.5 Themes

Two themes are available: Dark and Light; select the correct theme for the light level. Select the Settings icon to access Themes

Figure 1-2

1.13 Druck DPI 620 Genii, Modes (Ref Figure 1-3)

The Druck DPI 620 Genii can be used as follows:

- Calibrator (with independent functions on each of six channels)
  - Data logging capabilities
  - Documenting capabilities
- HART® Communicator
- Foundation Field-bus Communicator

1.13.1 Dashboard navigation

The Dashboard is navigated by swiping a finger from top to bottom while touching the screen. Functions screens are navigated by swiping a finger from right to left while touching the screen

1.13.2 Set Date, Time and Language

Select the Settings icon to access Date, Time and Language menus

1.13.3 Druck DPI 620 Genii Manual

Select the Help icon on the Dashboard to access the manual. All the information required to operate the Druck DPI 620 Genii, is in the Help section of the Dashboard

Figure 1-3

Note: *Fieldbus is not installed on all units*

1.14 Display Icons

Refer to Section 11 Display Icons

1.15 Set the Function Utility Options

For each function only one utility may be active. Not all source and measure functions have associated utilities

1.15.1 Max/Min.Avg

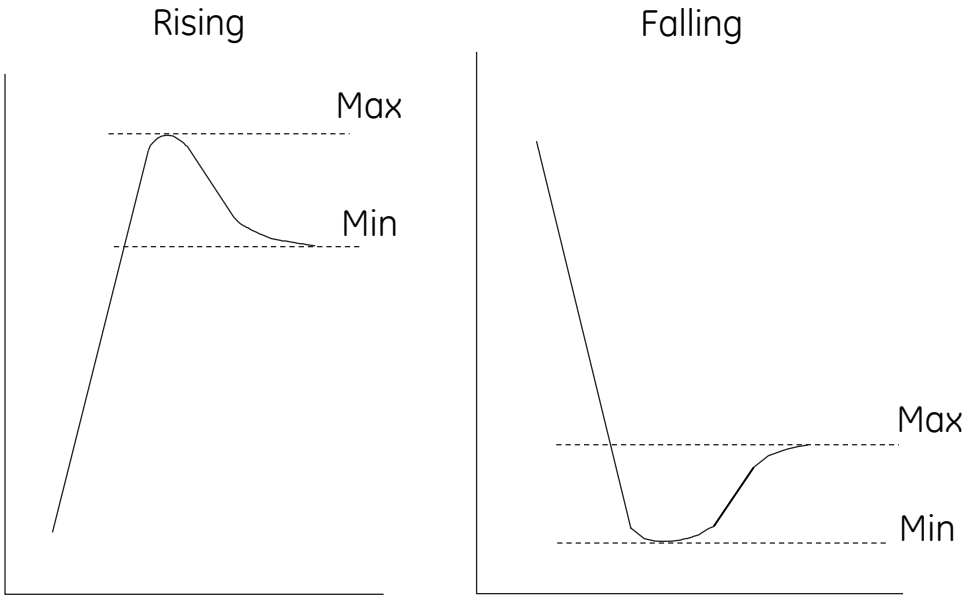
This utility is only available with measure functions. The additional values displayed show the minimum, maximum, and average values of the input signal

1.15.2 Switch Test

This utility is available with measure or source functions. The additional values displayed show signal values (measure or source) when the instrument detects a switch opening and closing. The difference between the two values is displayed as hysteresis value for the switch. This utility can be used with Ramp Automation, where the rising signal causes the switch to change state and the falling signal causes the switch to resume its' original state

1.15.3 Relief Valve

This utility is only available with measure functions. This utility tests circuits or mechanisms that have a cut-out response when an input reaches a defined threshold value. The utility allows the user to select a mode of operation which can be rising or falling. The utility displays additional values that represent the maximum and minimum values achieved by the input signal



1.16 Software and Firmware Upgrades

www.ge-mcs.com

Follow the website instructions to download the files onto a USB flash memory drive. Then use this menu to upgrade the calibrator

Note: If the software revision number is highlighted red then an upgrade is available

1. Enter the calibration PIN: 5487

2. Select the ✓ button. Then continue with one of these operations:

   - Upgrade the application software. To complete this operation
     1. Put the USB flash memory drive in the USB type A connector
     2. Select 'Application'
     3. Follow the on-screen instructions

     The software should be stored in a directory named AMC in the root directory of the USB memory drive

- Upgrade the operating system and bootloader software.
  1. Put the USB flash memory drive in the USB type A connector
  2. Select 'Operating System'
  3. Follow the on-screen instructions

  The software should be stored in a directory named OS in the root directory of the USB memory drive

Note: *If a mistake is made and there are no files to upload, follow the on-screen instructions and complete the procedure. When an upgrade completes normally, the initial operation of the touch screen is slower (a period of approximately 30 seconds).To make sure the upgrade completed correctly, use the Status menu*

1.17 Maintenance

The DPI620 Genii instrument contains no user serviceable parts and should be returned to a GE service center for repair

1.17.1 Cleaning

CAUTION

Do not use solvents or abrasive materials.

Clean the case and display with a lint free cloth and a weak detergent solution.

1.18 Instrument Return

1.18.1 Returned Material Procedure for USA

If the instrument is unserviceable and requires a repair return to a GE Service Center
Approved Service Agents
Web site: **www.ge-mcs.com**
Contact the GE Service Center, either by 'phone, fax or e-mail to obtain a Returned Material Authorization (RMA) number, providing the following information:

Product (i.e. Druck DPI 620
Genii) Serial number
Details of defect/work to be undertaken
Operating conditions

Safety Precautions

Provide information if the product has been in contact with any hazardous or toxic substances and, the relevant MSDS references and precautions to be taken when handling

Important notice

Do not use unauthorized sources to service this equipment as this will affect the warranty and may not guarantee further performance

1.18.2 Returned Goods Procedure for Europe

If the instrument is unserviceable and requires a repair return to a GE Service Centre

Approved Service Agents
Website **www.ge-mcs.com**
Contact the GE Service Centre, either by 'phone, fax or e-mail to obtain a Returned Goods Authorization (RGA) number, providing the following information:

Product (i.e. DPI 620)
Serial number
Details of defect/work to be undertaken

Operating conditions

Safety Precautions
Provide information if the product has been in contact with any hazardous or toxic substances and the relevant COSHH references and precautions to be taken when handling

Important Notice
Do not use unauthorized sources to service this equipment as this will affect the warranty and may not guarantee further performance. When discarding used equipment and batteries, obey all the local health and safety procedures

1.18.3 Instrument Disposal in the European Union

Do not dispose of this product or its battery as household waste. (Ref: mark)

Use an approved organization that collects and/or recycles the applicable item

For more information contact

- GE Sensing customer service department: (www.ge-mcs.com)
- Local government office

Marks and Symbols

CE	Complies with European Union directives
	USB ports: Type A; Mini Type B connector
	Ground (Earth)
	DC adaptor polarity: the centre of the plug is negative

2 Electrical Operations

2.1 Basic Calibrator Operation

1. Select CALIBRATOR from the Dashboard

2. Select the channel by performing the following tasks

   - Goto the TASK MENU by swiping the display from right to left.

- Press the CUSTOM TASK option this will allow the user to set up Channels 1 & 2.
- Select CH1 or CH2 to enter the CHANNEL SETTINGS menu

3. Setup a channel for measurement
   - FUNCTION to selects the function required (eg Current or Voltage). For more options scroll down the menu by swiping the display from bottom to top.
   - Press UNITS to select the type of unit required, please note that there may only be 1 type of unit available in particular Functions.
   - Press UTILITY to select the required utility.
   - Press CAPTION to change the caption, if required.

4. Once all settings have been selected, press the ✓ button at the bottom of the screen to return to the TASK SETTINGS screen.

   Please note for the settings to be set the user must also press the ✓ button in the TASK SETTINGS menu.

5. Repeat the above if another channel is required.

Other Task Menu Options available are:

- Default – Returns the settings to the default settings

The remaining options require a Pressure Module to be attached, please refer to Section.

- (P1-P2) TO V CH2 – Read differential output between both channels using CH2.
- P1 TO I CH1 MA – P1 current reading on CH1 using external loop source.
- P1 TO I CH2 MA (24V) – P1 current reading on CH1 using internal loop source.
- P1 TO I CH2 MA – P1 current reading on CH2 using external loop source.
- P2 TO I CH1 MA – P2 current reading on CH1 using external loop source.
- P2 TO I CH2 MA (24V) – P2 current reading on CH1 using internal loop source.
- P2 TO I CH2 MA – P2 current reading on CH2 using external loop source.

2.1.1 Measurement Display Options

There are 2 display views in the CALIBRATOR screen when multiple channels are in use:

- View 1 displays a reduced view of all the selected channels.

- View 2 displays an expanded view of the selected channel and minimizes the remaining channels.

The displays options can be changed by pressing the channel the user wants to display in expanded view.

2.2 Example Procedure: Measure or Source Current

Example (A) shows CH1 set-up to measure or source a current with external loop power

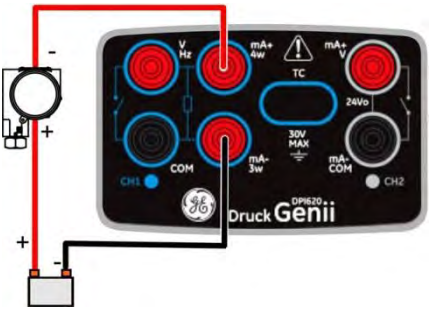
Note: *When using the CH2 connectors, set CH 2 to measure or source these ranges with internal or external loop power (internal loop power = 24 V). Set the appropriate function by selecting mA or mA +24V. Loop drive has three possible settings:*

1) OFF 2) 24V 3) 28V

Example A

Measure current on CH1.

Range: ±55mA



1. Set the applicable software option
2. Complete the electrical connections and continue with the measure or source operation
3. Source only (Automation). Set the applicable output value

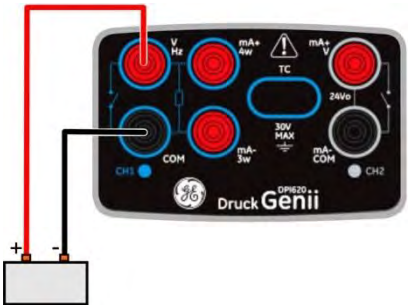
2.3 Example Procedure: Measure DC Voltage

Example (A) shows CH1 set-up to measure a DC voltage or DC mV

Note: *When using the CH2 connectors, set-up CH2 to measure these range.*

Example A
Measure DC Volts or DC mV on CH1.

Range: ±30 V DC



1. Set the applicable software options
2. Complete the electrical connections and continue with the measure operation

2.4 Example Procedure: Measure AC Voltage (CH1), 0 to 20 Vrms Only

WARNING

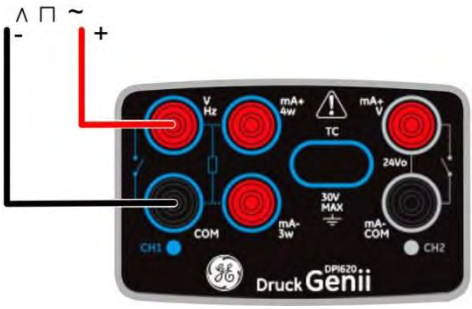
To prevent electrical shocks, use only the GE specified AC probe (Part: IO620-AC) to measure AC voltages that are more than 20 Vrms (maximum: 300 Vrms). Attach it to the specified connections only

Examples (A) show CH1 set-up to measure an AC voltage or AC mV (0 to 20 Vrms only).

Example A

Measure AC Volts or AC mV on CH1

Range: 0 to 20 V rms



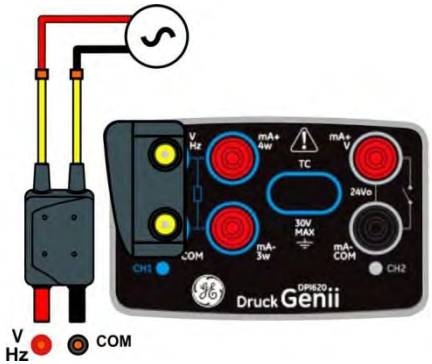
1. Set the applicable software options
2. Complete the electrical connections and continue with the measure operation

2.5 Example Procedure: Measure AC Voltage (CH1) with the AC Probe

WARNING

To prevent electrical shocks, use only the GE specified AC probe (Part: IO620-AC) to measure AC voltages that are more than 20 Vrms (maximum: 300 Vrms). Attach it to the specified connections only

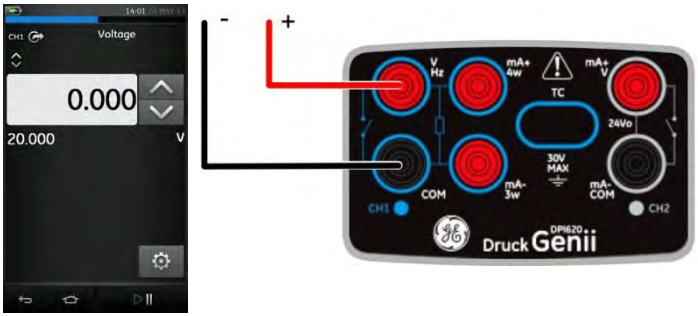
The example shows CH1 set-up to measure an AC voltage with the AC probe Maximum: 300 V rms



1. Set the applicable software options for the AC Probe.
2. Complete the electrical connections Red - V/Hz connector, Black - COM connector. Then continue with the measure operation

2.6 Example Procedure: Source DC Voltage (CH1)

.This example show CH1 set-up to source a DC voltage on CH1Range: 0 to 20 V DC



1. Set the applicable software options
2. Complete the electrical connections
3. To continue, set the applicable output value

2.7 Example Procedure: Measure or Source Current with Internal 24V Loop Power

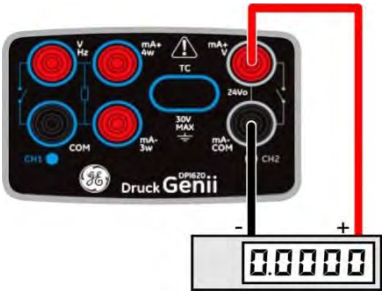
Examples (A and B) show CH2 set-up to measure or source a current with internal loop power (24 V).

Example A

Measure current on CH2 + internal loop power (24V). Range: ±55mA

Example B

Source current on CH2 + internal loop power (24V). Range: 0 to 24 mA



1. Set the applicable software options
2. Complete the electrical connections and continue with the measure or source operation
3. Source only (Automation): Set the applicable output value

2.8 Example Procedure: Measure or Source Frequency Signals

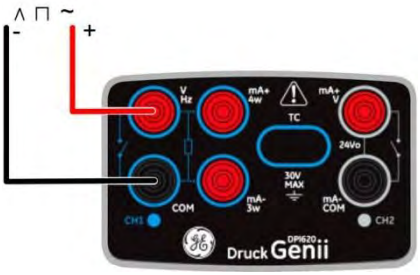
Examples (A and B) show CH1 set-up to measure or source a frequency. The units could be Hz, kHz or counts (cpm or cph)

Example A

Measure Frequency

Example B

Source Frequency



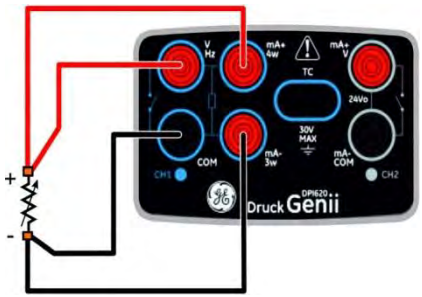
Example A	Example B
Measure frequency on CH1 Range: 0 to 50 kHz Trigger level: 2.5V	Source frequency on CH1 Range: 0 to 50 kHz Waveform: Triangle Amplitude:12.0 V
1. Set the applicable software options 2. Complete the electrical connections 3. If necessary, change the Trigger Level (Settings) and continue with the measure operation 4. Set the values that follow: Mode (Automatic/Manual) Manual Level (trigger level value)	1. Set the applicable software options 2. Complete the electrical connections 3. If necessary, change the Source Settings and continue with source operation 4. Set the values that follow: Waveform (Square, Triangle and Sine) Amplitude (Amplitude value) Automation: Set the applicable output value.

2.9 Example Procedure: Measure/Simulate a Resistance Temperature Detector (RTD)

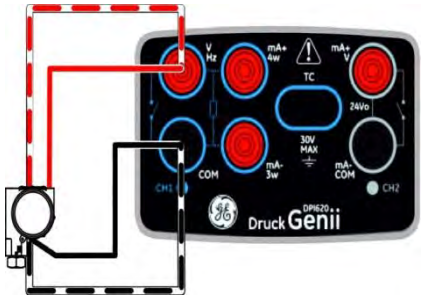
Examples (A and B) show CH1 set-up to measure or simulate an RTD. A 4-wire configuration gives the best accuracy; a 2-wire configuration has the lowest accuracy (4- wire RTD shown)

To measure or simulate resistance Ω, set the Resistance function

Example A
Measure
RTD



Example B
Source RTD



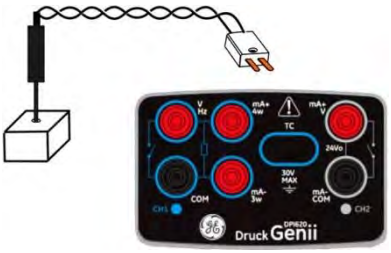
Example A	Example B
Measure an RTD on CH1 Range: 850°C RTD type: PT100 Connection: 4-Wire	Simulate an RTD on CH1 Range: 850°C RTD type: PT100 Connection: 4-Wire
1. Set the applicable software options 2. Complete the electrical connections 3. If necessary change the Settings and continue with the measure operation. Set the applicable RTD	1. Set the applicable software options 2. Complete the electrical connections 3. If necessary change the Source Settings and continue with source operation. Set the applicable RTD 4. Automation: Set the applicable output value

2.10 Example Procedure: Measure or Simulate a Thermocouple (TC)

Examples (A and B) show CH1 set-up to measure or simulate a TC temperature.

To measure or simulate TC millivolts, set the TC mV function

Example A
Measure TC



Example B
Source TC

Example A	Example B
Measure a TC temperature on CH1 Range: 1372°C TC type: K Type Cold Junction: 32.66	Simulate a TC temperature on CH1 Range: 1372°C TC type: K Type Cold Junction: 32.66
1. Set the applicable software options 2. Complete the electrical connections 3. If necessary change the Settings and continue with the measure operation *TC Type* *CJ compensation* (Mode: Automatic/ Manual). Automatic uses the internal cold junction. Use Manual mode to use an external cold junction. *CJ Value*. For Manual mode, set an applicable value. The value is not used in Automatic mode	1. Set the applicable software options 2. Complete the electrical connections 3. If necessary change the Source Settings and continue with source operation *TC Type* *CJ compensation* (Mode: Automatic/ Manual). Automatic uses the internal cold junction. Use Manual mode to use an external cold junction. *CJ Value* For Manual mode, set an applicable value. The value is not used in Automatic mode 4. Automation: Set the applicable output value

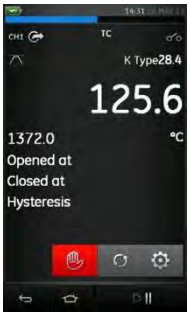
2.11 Example Procedure: Switch Test

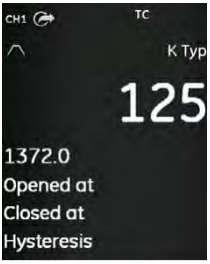
CH1, P1, P2 and IDOS functions use the CH2 switch connections. CH2 functions use the CH1 switch connections

Switch operation

When setting the Switch Test utility on one channel, the software automatically sets-up the other channel for the switch connections

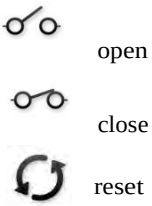
Note: *If there is a measure or source function on the switch connection channel it is automatically disabled. The display will show a screen message "Function Disabled"*





The example that follows shows a thermocouple switch:

1. Set the applicable software options
   - The TC is set to source a temperature
   - The Utility is set to Switch Test. The Automation is set to Ramp
2. Complete the electrical connections
3. It is a CH1 function, the switch connections must be on CH2
4. For the Ramp process, set “High” and “Low” values that are applicable to the switch value
5. To get an accurate switch value, set a long “Travel” period use Start/Stop to start and stop the “Ramp” cycle. If necessary, supply the output values in the opposite direction until the switch changes condition again
6. The display will show the following:
   - Values to open a close the switch
   - Hysteresis value



7. To do the test again press the reset button

2.12 Measure Pressure: IDOS Option

Optional item. An IDOS Universal Pressure Module (UPM) uses Intelligent Digital Output Sensor (IDOS) technology to measure the applied pressure and supply the data to an IDOS instrument. Before using an IDOS module, (Ref: User Manual: K0378, Druck IDOS UPM)

Note: *To attach an IDOS module to the Druck DPI 620 Genii calibrator use an IO620-IDOS-USBadaptor*

2.12.1 IDOS Option Assembly Instructions

Step	Procedure
1.	Attach one end of the adaptor IO620-IDOS-USB to the applicable IDOS module
2.	Push the Type A end of USB Cable into the USB socket on the instrument and the type B end into the adaptor (IO620-IDOS-USB)
3.	Set the instrument power on
	When this symbol flashes at the top of the display, it shows there is communication between the IDOS module and the calibrator

When the assembly is complete use these procedures to measure the pressure with the IDOS function

2.12.2 IDOS Function Procedures

Set the calibrator functions for use on the display.

This includes:

- IDOS function (to measure the pressure)
- Maximum: 6 functions
- If necessary, change the Units for the function
- If necessary, set a Utility for the function:
  - i Max/Min/Avg
  - ii Switch Test
  - iii Leak Test . The procedure is the same for an IDOS module or for a MC 620/PM 620 assembly
- If necessary, change the Settings for the IDOS function:
- Process (Tare, Alarm, Filter, Flow, Scaling)
  - i Leak Test (Only when the Utility is set). The procedure is the same for an IDOS module or for a MC 620/PM 620 assembly
  - ii Zero. The procedure is the same for an IDOS module or for a PM 620 module. Zero the gauge sensor before use
- Continue with the pressure operation

2.13 Example Procedure: Measure Pressure with an IDOS Module

1. Assemble the DPI 620 calibrator and the IDOS module
2. To attach the external pressure equipment, (Ref: User Manual: K0378, Druck IDOS UPM
3. Set the applicable software options

2.14 Error Indications

If the display shows <<<< (under range) or >>>> (over range):

- Make sure that the range is correct.
- Make sure that all the related equipment and connections are serviceable

Under range: The display shows this symbol for this condition: <<<<<

Reading < Negative FS - (2% of negative FS)

Over range: The display shows this symbol for this condition: >>>>>

Reading > Positive FS + (2% of positive FS)

3 Pressure Indicator Operation (MC620)

This section gives examples of how to connect and use the instrument to measure pressure with the module carrier (MC 620) and the applicable pressure modules (PM 620).

To make a fully integrated pressure calibrator instrument with one of the three Pressure Stations, refer to the User Manual for the PV62x Series of Pressure Stations, K0457

Do not use a damaged instrument

1. Pressure connection (G1/8 or 1/8 NPT) to attach external pressure equipment
2. Pressure and electrical connections for a pressure module (PM 620). These are self- sealing pressure connections
3. Two screws to attach the calibrator (Druck DPI 620 Genii)
4. Electrical connections for the calibrator (Druck DPI 620 Genii)
5. Pressure module (PM 620) with a pressure connection, reference port (a) and a label

The label includes:
Pressure range: - g: gauge; a: absolute,
Serial Number (S/N);
manufacturer: name, address, website

This section shows the parts of the Module Carrier (MC 620) and Pressure Module (PM 620)

CAUTION

To prevent damage to the PM 620 module, only use it within the specified pressure limit on the label

When the items are attached to the Druck DPI 620 Genii it is a fully integrated pressure indicator, measuring pneumatic or hydraulic pressure

3.1 Assembly Instructions

3.1.1 Pressure Connections

WARNING

Pressurized gases and fluids are dangerous. Before attaching or disconnecting pressure equipment, safely release all the pressure.

The pressure ports for external equipment use "Quick fit" pressure adaptors

3.2 Procedure (Attaching External Equipment)

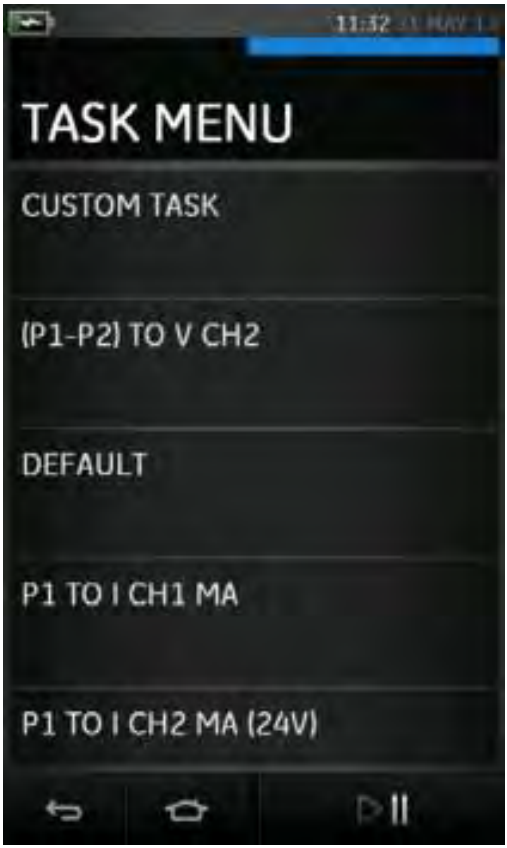
1. Remove the adaptor from the pressure port
2. Use an applicable seal for the pressure connection
   - i NPT type: Use an applicable sealant on the thread
   - ii BSP (parallel) type: Use the applicable bonded seal at the bottom
   - iii BSP (parallel) type, 100 bar (1500 psi) or less: a bonded seal at the top is permitted
3. Attach the adaptor to the external equipment if necessary use an alternative adaptor
4. Tighten to the applicable torque
5. Attach the adaptor to the MC 620 carrier and hand- tighten

3.3 Measure Pressure

When the pressure indicator assembly is complete use the menus to set-up the necessary operations

1. Align the two slots on the calibrator with the two posts on the module carrier.
2. When the posts are fully engaged in the slots, tighten the two screws hand-tight.
3. Attach one or two PM 620 modules with the correct range and type.
4. Tighten each PM 620 modules hand-tight only.
5. When the symbol flashes at the top of the display, there is communication between the module and the calibrator.

3.3.1 Procedure Overview



To use the pressure indicator, complete the procedures that follow:

1. Pressure function (P1 and/or P2)
2. Channel 1 (CH 1) electrical function (measure or source)
3. Channel 2 (CH 2) electrical function (measure or source)

If required, change the Units or the function. If necessary, set a Utility for the function:

- Max/Min/Avg
- Switch Test
- Relief valve
- Leak Test

If required, change the Settings for the pressure function:

- Process (Tare, Alarm, Filter, Flow, Scaling
- Leak Test (Only when the Utility is set)
- Relief valve (Only when the Utility is set)
- Zero. Zero the gauge sensor before use

When all the software selections are complete, make the applicable pressure and electrical connections

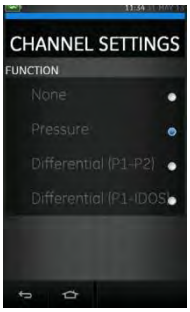
3.4 Set up a Leak Test

1. Set the Utility to Leak Test
2. After setting the Utility to Leak Test, set the options that follow:

   i Wait Time:
   The time before the test starts in hours:minutes:seconds (hh:mm:ss).

   ii Test Time:
   The period of the leak test in hours:minutes:seconds (hh:mm:ss)

Note: To set the Leak Test options, a pressure module must be correctly installed



3.5 Set the Pressure Module to Zero

Use this option to write a new zero pressure value to the pressure module in use. The sensor adjustment is permitted if it obeys the condition that follows:

- Adjustment ≤10% FS positive pressure value (for the Sensor)

Note: To make a temporary adjustment for zero, use the Tare function

3.6 Example Procedure: Measure Pressure

1 Assemble the pressure indicator with the correct PM 620 modules
2 Set the applicable software options

3.7 Error Indications

If the display shows <<<< (under range) or >>>> (over range)

- Make sure that the range is correct
- Make sure that all the related equipment and connections are serviceable. Under range: The display shows this symbol for this condition
- Reading < Negative FS - (10% of negative FS)

Over range: The display shows this symbol for this condition

- Reading > Positive FS + (10% of positive FS)

4 Data Logging Operation

Select the Data Logging option on the Dashboard. The Data Logging function records instrument readings so they can be reviewed or analyzed. The data file can be reviewed by using the following:

- Recall

The data file can be processed externally by using the following

- Transferred to a USB stick
- Transferred to a computer

This chapter describes how to use the Data Logging function to log data to a file

In Data Logging mode the display data from all active channels is stored at each data point. The data can be stored:

- Periodically
- Key press

The data is stored in the internal memory or on an SD card until the Data Logging is stopped. When Data Logging has stopped data can be automatically transferred to a USB Flash Drive

4.1 Set-up

Before starting set all channels to the correct functions. To access the Data logging function do the following:

- Dashboard > Data Logging > Setup.

Use the menu that follows to set the Data Logging functions

- Storage Area
  Used to set Internal or SD card storage. Only the SD card can be read when connected to a PC
- Filename
  Enter the filename (10 characters maximum)
- Trigger
  Select one of the following:
  - Key Press (logs one data point each time the button is pressed)
  - Periodic (logs one data point at a set time interval)
- Period
  Used to set the time interval for periodic data logging
- Transfer When Complete
  Used to transfer data to a Flash Drive

4.2 Operation

To begin data logging tap 'Start logging' button.

In 'Periodic' mode an icon flashes in the status bar each time a data point is logged.

In 'Key Press' mode tap the Log Button to log a data point.

To stop data logging the tap Stop.

4.3 File Review

Tap the Recall button in the Data logging menu to see the Log playback menu

To view a data file point by point do the following:

1. Tap the Filename button to display the list of data files
2. Select the file to be displayed
3. Tap ✓ to see the data display
4. To step the display one data point, tap the Next Log button

Note: *The data point number sequence is displayed in the top right-hand corner (e.g. 4 of 100)*

5. To go back one data point, press the Previous Log button
7. Exit the screen

4.4 File Management

The data log file management options are as follows:

- Transfer: Upload data log files to another computer
- Erase: delete data log files
- Memory Status: Displays amount of free memory

4.4.1 Transfer

Data may be transferred as follows:

- USB Flash Drive: Selected files are written in the root folder of the USB Flash Drive
- SD card: Data logged in an internal storage area can be transferred to the SD card storage area
- USB Serial Port: Transfers data as a text file to a computer. A communications program can be used to receive the data (e.g. Microsoft® Hyper Terminal). The serial set-up is as follows:
  - i Baud rate - 19,200 bits/sec
  - ii Data bits – 8
  - iii Parity - none
  - iv Stop bits -1

4.4.2 Erase

The Erase options are as follows:

- Erase One File: Select file and tap tick bottom right on the screen to erase
- Clear Internal: Clears all internal files

4.4.3 Memory Status

The memory status button will show the amount of available memory in the areas that follow:

- Internal
- USB Flash Drive (if fitted)
- SD card

4.5 Data Format

The data files are produced in a Comma Separated Variable (csv) format (refer to Figure 4-1).. This allows the data to be imported into a spreadsheet (e.g. Microsoft® Excel). The first section of the data file contains the following:

- FILENAME - The data file name
- COLUMNS - Information for internal use
- START - Datalog start time
- VERSION - Data format version
- CHANNEL - The function setting of each active channel

The second section of the data file contains the following:

- Individual headings
- Data point data

```
FILENAME,P080821A
COLUMNS,3,9
START,21 Aug 2008, 21:38:59
CHANNEL 001, Current (24V),In,mA,55
CHANNEL 005, HART,In,,0
DATA,START
ID,Date,Time,Main Reading,Secondary Reading,
0,21 Aug 2008, 21:39:14,8.7525,24V,4,0,False
1,21 Aug 2008, 21:39:29,8.5711,24V,4,0,False
2,21 Aug 2008, 21:39:44,8.4080,24V,4,0,False
3,21 Aug 2008, 21:39:59,8.2475,24V,4,0,False
4,21 Aug 2008, 21:40:14,8.0733,24V,4,0,False
5,21 Aug 2008, 21:40:29,7.9288,24V,4,0,False
```

Figure 4-1 Example .csv Datalog File

5 Documentation

This chapter describes the Documenting functions available with the Druck DPI 620 Genii calibrator and are as follows:

- Analysis
- Run Procedure

5.1 Analysis

The Analysis function takes readings from two or more DPI 620 channels to calibrate the transfer data of the device being tested. One channel is the Reference channel and is used as follows:

- Provides a measure of the input signal to the device
- If calibrating a temperature transmitter the Reference channel could be CH1 in either RTD or TC source mode
- If the device is a pressure transmitter the Reference channel would be P1 or P2 measuring the input pressure to the device

The other channel is the Input channel and is used as follows:

- Measures the output signal from the device
- If calibrating a process transmitter it could be CH2 in Current Measure mode

A second input channel can also be used, to transfer data between three points in the signal path and may be calibrated at the same time, as in the example that follows.

- When calibrating a process transmitter that is HART® enabled the second input channel could be the HART® channel. The HART® channel reads the Primary Variable (PV) value from the sensor in the process transmitter this would allow the pressure sensor to be calibrated at the same time as the current loop output

Any active channel that is not defined as Reference is Input by default.

There must be one Reference channel and at least one Input channel defined for the Analysis function set-up to be correct.

When the DPI620 is set-up, do the following:

1. Set the Reference signal to each calibration signal

    - At each value the Analysis function calculates the difference of each Input channel to the ideal transfer characteristic and compares this to a tolerance limit
    - The deviation is shown in %Span or %Rdg
    - The tolerance test result is shown as a Pass [Pass] or [Fail] icon

5.2 Set-up

1. Set the Druck DPI 620 Genii channels in the Calibrator function
2. Connect the calibrator to the device
3. Enter the Documenting function
4. Tap the Analysis button

5.2.1 Define the Reference Channel

1. Tap the channel button that is to be used as the Reference channel for the analysis
2. Set the channel type to Reference
3. All other channel settings for that channel are cancelled. All other active channels are set to Input

5.2.2 Define each Input Channel

1. Tap each Input channel button to set the options that follow:
    - Scaling - the scaling values are four set values
    - The maximum and minimum Reference signal values (Reference High and Reference Low)
    - The Input signal values (Input High and Input Low)
    - The Input signals should relate to the maximum and minimum Reference signal values

2. Error type -the deviation from which the transfer characteristic is to be calculated. This can be one of the following:
    - % Span as a percentage of the input signal span
    - % Rdg as a percentage of the input signal reading

3. Linearity - the transfer characteristic from Reference to input signal. This can be one of the following:
    - Linear: a proportional response
    - Square Root: often found in flow sensors

4. Tolerance - the test limits for the deviation from the transfer characteristics

5.3 Analysis Function

Set Input channel parameters, and tap Start. The Analysis window displays the following:

- The deviation of each Input channel from the ideal transfer characteristic
- A tolerance limit test icon
- Pass [Pass] (within tolerance test limit)
- Fail [Fail] (outside tolerance test limit)

To check the full range of the device do the following:

1. Step the Reference signal value through its range
2. Check the Analysis window at each step
3. If the Reference is sourced from the calibrator, move to the channel window to change the Reference value
4. Return to the Analysis window
5. When the analysis is complete exit the window

5.4 Run Procedure

The purpose of the Run procedure is to do calibration procedures which have been downloaded from 4 Sight software. The 4 Sight calibration procedure contains all the values to calibrate a device under test (test points, ramp time)

The same calibration procedure can be used for all the applicable devices under test. To use the Run Procedure function, the following items are required:

- A copy of the 4 Sight Calibration Software
- Standard USB lead (as supplied)
- A Druck DPI 620 Genii calibrator device driver available as a download from the website www.ge-mcs.com

5.4.1 Sequence to Upload and Download File

Step	Procedure
1.	Connect Standard USB lead (as supplied) to the Druck. DPI 620 Genii calibrator.
2.	Connect the lead to the USB port on the computer that has the calibrator manager installed.
3.	Use 4 Sight to set-up the procedure and create a work order for the device. The procedure includes the parameters for the calibration, the number of test points, the relationship and pass/fail tolerance.
4.	Use the Download button in calibrator manager to Download the file to the Druck DPI 620 Genii calibrator. A communications symbol will be displayed at the bottom of the screen.
5.	Tap the Run Procedure option.
6.	In the Results window, select the filename specified in calibrator manager.
7.	Enter the User ID and the DUT Serial Number.
8.	Tap on the Start button. The Procedure sets up the necessary Channel options e.g. mA and Volts.
9.	Use the Take Reading button at each point specified by the procedure. A prompt shows for each point.
10.	When all the readings are complete, tap on the Exit button. Look at the results on the display (As found/As Left).
11.	To complete the process, use the calibrator manager to Upload the file back into the 4 Sight database

6 HART® Operations

The Druck DPI 620 Genii can communicate with devices that use the HART® protocol

- The Universal and Common Practice commands specified in HART®revision 5 to 7
- Devices that support Device Descriptions (DD). This section includes procedures to use the HART functions available in the calibrator

6.1 HART® Menu Operations

The HART®application is started from the dashboard. The HART® uses a digital signal on top of a standard 4 - 20 mA current loop to get data to and from a HART® enabled field device. Typical operations include the following:

- Read the primary variable and the analogue output
- Read the device serial number, type and supplier
- Get calibration data (upper and lower range values, sensor limits, calibration date)
- Do status and fault finding checks
- Change the device configuration (range, units, damping)

The Druck DPI 620 Genii can be used to communicate with other devices that use a HART®application as follows:

- One HART device (a master device) starts and controls the communications
- The field device (a slave device) uses each command from the master device to make a change and/or send data back
- Two master devices are permitted: a primary master (usually the main control and monitor system), and a secondary master (usually a hand-held communicator)
- The Druck DPI 620 Genii operates as a secondary master

6.2 Start-up

In the start-up procedure the Druck DPI 620 Genii displays “HART® SDC Loading”

6.3 Screen Format

The Druck DPI 620 Genii displays the HART®application screen in light or dark mode

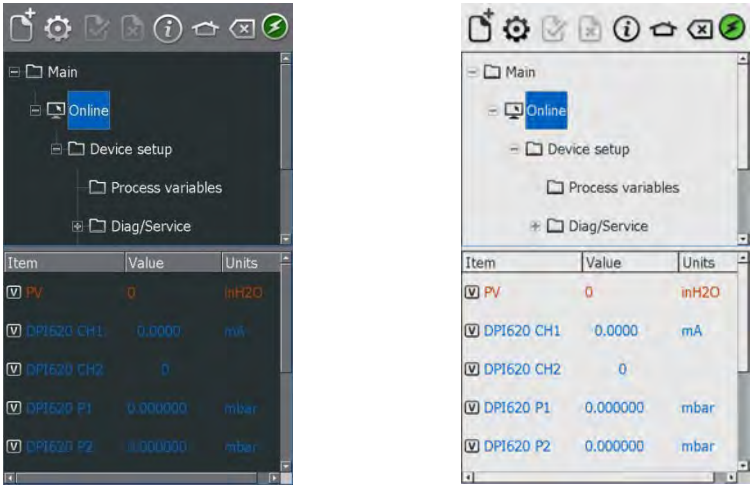


Figure 6-1

6.4 HART® Window

The HART®window shows the following:

- Primary Variable Lower Range Value (PV LRV)
- Primary Variable Upper Range Value (PV URV)
- Primary Variable (PV)
- Loop current value

6.5 HART® Connections

Before setting-up the electrical connections between the HART® device and the Druck DPI 620 Genii get the correct connection scheme (Ref: Help menu on Dashboard)

6.6 Power Supply from the Calibrator

A 24 V or 28 V loop drive can be supplied using the CH2 mA (24V) measure function

In the example that follows, the Druck DPI 620 Genii supplies the loop power and a 250 Ω HART® resistor

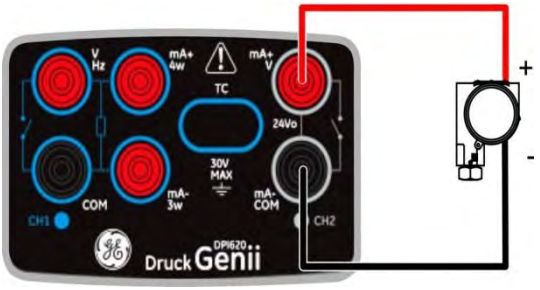


Figure 6-2

6.7 External Loop Power

In the example that follows, there is an external power supply

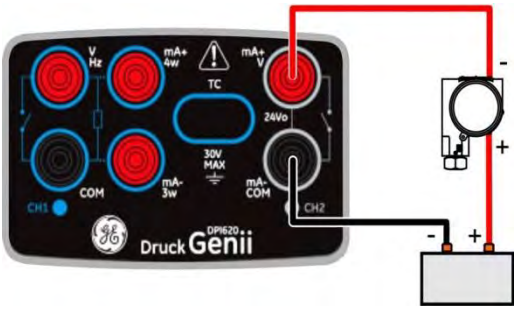


Figure 6-3

Measure current on CH2 without 24 V loop power.

HART® function is enabled and 250 Ω resistor is enabled

6.8 Communicator Attached to a Network

In the example that follows, the calibrator connects directly to a network. There must be a 250 Ω resistor in series with the loop power supply and the HART® device

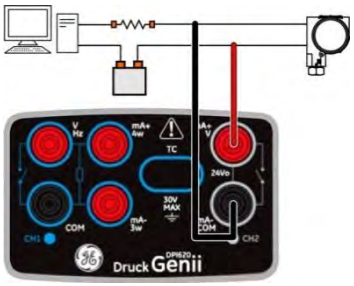
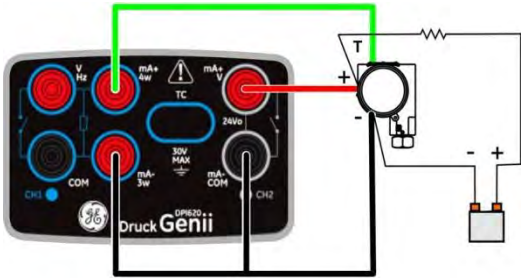


Figure 6-4

No function on CH2. HART® function is enabled and 250 Ω resistor is set to Off

6.9 Use of Test Connections

Use the test connection with a HART® transmitter. Use CH1 to measure current and CH2 to communicate with the HART® device. CH2 must be turned off, and CH1 must be placed into current measure mode. There must be an external HART® resistor in the loop



6.10 Data Display

The display data is color coded as follows:

- Red - HART® transmitter data
- Blue - Druck DPI 620 Genii channel data
- Black - can be edited

For data display identification icons (Ref: Section 11)

Common acronyms used are as follows:

- PV - Primary Variable
- AO - Analogue Output
- URV - Upper Range Value
- LRV - Lower Range Value
- USL - Upper Sensing Limit
- LSL - Lower Sensing Limit

The data display also shows the current readings of the DPI 620 instrument channels. This is used in calibration procedures

6.11 Editing Values

Any value displayed in black with a [V] or [E] icon can be edited. Edit variables as follows:

1. Tap the variable
2. If a selection window is opened tap the variable

3. Enter a new value
4. Tap the Set button
5. Tap Yes in the warning window
6. The new value is highlighted in yellow

Note: *To go back to the original value, tap the Undo button in the menu bar*

7. Tap Commit button in the menu bar to implement a new value
8. The yellow highlight will disappear

6.12 Executing Methods

Not all HART® devices have the same methods available.

The function, purpose and execution of each method can be different. Methods may include the following:

- Self-test
- Loop test
- Sensor trim
- D/A trim

Execute a method as follows:

1. Tap the method name. A screen opens with information about the selected method. Four buttons are displayed on the screen

    - Help - Displays a description of the method
    - Abort - Exits from the procedure
    - OK - Accepts inputs and proceeds to the next step
    - Switch App - returns to Druck DPI 620 Genii screen (changes channel function settings without interrupting the method procedure)

2. Some methods may make the HART® device output a certain current

Note: *A warning will appear on the screen before the devices enters the mode.*

3. Some methods need entry values, use the alpha/numeric keypads
4. A drop down menu can be used for method selection options
5. Some methods require input from the DPI 620 instrument channels. A drop down menu displays the channels as follows:
    - CH1
    - CH2
    - P1
    - P2
    - IDOS

6. On completion the procedure will return to the HART® application. If required use the Abort button

6.12.1 Method Example - Self-test

1. To confirm that the transmitter is functioning correctly, navigate to the Test device folder
2. Select the Test device folder
3. Select OK

The self-test executes

6.12.2 Method Example - D/A Trim

The Druck DPI 620 Genii can perform an analogue trim on the 4 to 20 mA loop without connecting to any external reference meters

1. Navigate to the calibrator folder
2. Select D/A trim

Follow the on-screen instructions

1. Enter the Analogue value of Primary Variable Ma current (actual calibrated value)
2. Tap Set
3. Repeat steps 1 and 2 with 20 mA selected. This will calibrate the transmitter's output current

6.13 Preferences

Select the applicable icon to change the poll address, short tag or long tag

- Poll Address - when each transmitter has a unique address
- Short tag - if the transmitter supports 8 character tags
- Long tag - if the transmitter supports 32 character tags

Transmitters with a non-zero poll address default to a fixed loop current of 4 mA. By default, the Druck DPI 620 Genii polls address 0 (zero) only. Change the Poll Address by selecting the appropriate search radio button or entering the tag name in the search field

6.14 Failed to find Device

Fault	Possible Cause	Action
Failed to find device	Power Supply	Check device is turned on Check applicable fuses Check the supply voltage is within limits Check the loop current is in the range 3.5mA to 24mA
	Device under test	Check device is HART® compatible Connect multiple devices one at a time
	Circuit	Check circuit connections Check circuit Continuity Check correct polarity of supply to the transmitter Check the HART® resistor is in the correct place in the loop Check the HART® resistor has the correct value
	Druck DPI 620 Genii	Check the Druck DPI 620 Genii is connected to the correct points in the loop No external HART® resistor present, check the internal resistor setting External HART® resistor present, check the DPI 620 resistor setting is OFF Check that the CH 2 function is set to 'NONE' if the Druck DPI 620 Genii is used as a secondary master (in parallel with an external supply
	Preferences	Select the 'search 0-63' option to scan all possible Poll Addresses to get the Poll Address and Tag details of the connected device

7 Foundation Fieldbus™

7.1 Introduction

FOUNDATION™ Field bus (FF) is a device application for configuration of FF enabled field devices. On-line connection is via the integrated H1 modem. Devices directly connected to an H1 field segment can be configured and supported by FF

7.2 The Navigation (Menu) Tree

This is the overview of the entire loaded block of the device (this is not the entire field device only one aspect of it) showing all the menus available according to the configured access level. Many field devices have additional menus that become visible when certain access rights are enabled or other parameters set. The navigation tree shows nested menus with a '+' to the left of the description. A momentary touch of this symbol with the stylus opens up the view to the lower level. This view can deeper view can be closed by a left momentary touch on the view '-' setting. In this way even complex devices menu structures can be navigated quickly and clearly.

If the device does not specify a menu definition in the FF Device Description 2 menus will be generated automatically as follows:

- Methods - all method dialogs are grouped under this menu
- Review - all parameters are grouped under this menu

7.3 The Navigation Tree Bar

This shows the hierarchy of menus and groups above the current Function Group view. In all Function Group views the 'Navigation Tree Bar' is visible. In this way it is easy for the operator to see the menu structure of the current location without returning to the Tree View. Navigation back out of the Function Group view is also possible by the blue highlighted references in the Tree Bar view itself. Navigation of the selected Function Group is also made available via the up and down navigation arrows. The momentary touch of these moves the in view Function Group to that of one below or above the current selection

7.4 Functional Group View

The functional groups show all the variables or settings in that menu group along with the current value. The left side with grey background hosts the 'Variable Description Area' and access to the context based adjustment functions. The right side with light background hosts the 'Variable Editing Area' and access to value adjustment. A grey value is associated with a read only value such as a variable that the device produces. Black variables are open for editing under the appropriate access conditions, such as access code or PIN that may be required in a different Functional Group

7.5 Background Attribute Population

FF populates the on line device image with a background reading mechanism. If after block load the user selects a menu that has not been populated yet then the application re- prioritizes the reading order to address the current menu selection. In this way device sessions for simple adjustments can be very short as there is no need to wait for a complete device image upload to perform the adjustment, Communication activity is signified by the communication progress bar in the bottom right of the screen

7.6 Reading & writing data - general

The reading and writing of data is decoupled from the user interface by the asynchronous data population mechanism. In this way the application manages the flow of data to and from the remote field device most efficiently. The status of an outstanding read or writes is displayed in the Variable Editing Area

READING - When a read is requested by the user the variable goes grey and in the right area of the Variable Editing area the pending icon appears. When the read request is fulfilled the variable goes from grey to black again and the pending icon disappears

WRITING - When a write is requested by the user the variable goes grey and in the right area of the Variable Editing area the pending icon appears. When the write request is fulfilled the variable goes from grey to black again and the pending icon disappears. Methods execution - When a method is running from a button or selection then the method icon is displayed whilst the method is in progress

7.7 Function Finder

Function Finder is a way of searching for FF variables and device functions in the on-line device. In complex devices with multiple menus this allows the user to navigate a device without a manual, greatly simplifying the on-line experience, even with an unfamiliar device. The system requires the input of the name of the variable concerned (or part thereof) and the results show all variables that match the search. Navigation to the variable is just a single click in the search results. To start a search proceed as follows in the on line or off-line device view

1. Select the icon in the environment view
2. In Name field enter the text you wish to search for in the on- line device
3. Select return in the keyboard view or the Search button to initiate the search
4. From the list of results select the parameter that you require. Note that the variable name and the function group it relates to is displayed
5. Function Finder will then display the Function Group concerned in the device view and the searched variable will be highlighted in yellow

7.8 Navigating the Device

The functional group tree is navigated with stylus actions that allow the nested menu structures to be viewed. If a function group is opened with a momentary stylus touch then the view changes to the Functional Group View. Viewing values and access to settings is made from this view. The individual Function Groups can also be navigated from the Navigation Tree Bar

7.9 Altering a Device Setting

In the Function Group view settings can be edited. There are 4 different types of edit:

- Number - Start the editing action with a momentary stylus touch in the variable editing area
- Selector - The editing action is started with a momentary stylus touch in the variable editing area. The available choices are shown in a drop down list. A momentary stylus action selects them
- Method - This is viewed as a button or selection menu. In the case of a button, a momentary touch with the stylus activates the execution of the associated functionality. The user then follows any defined prompts to walk through the method

- Date & Time - Date and time is implemented with the additional support of clock calendar controls. All editing actions performed by stylus actions

7.10 Reverting a Single Changed Attribute

After editing and before commitment the device setting can be reverted as follows:

- Touch and hold the stylus in the Variable Description Area of the parameter to be reverted. The context menu will appear. Select Revert. The pre-edited value will now appear in the Variable Editing Area of the nominated parameter

7.11 Committing Outstanding Changes

Changes in parameter settings are not sent to the device writing mechanism of the application until they are committed. After editing select the 'tick' in the upper task bar. The application will now write the variable (Signified by the transaction display on the read / write progress bar) or prompt for a commit via a dialog box. Please note the latter is a selection option in the configuration called "One Click Editing"

7.12 Rolling Back Outstanding Changes

After a setting change has been made it can be "rolled back" to the original value. This can only occur if the change has not yet been committed. See COMMITTING OUTSTANDING CHANGES. This is performed by a 'right click' touch and hold of the stylus in the Variable Description area and selecting the revert option from the displayed context menu. The original value is now reinstated

7.13 Refreshing Values and Groups

The Function Groups and variables contained within them can be refreshed at any time. A 'right click' touch and hold of the stylus in the Variable Description area will open a context menu. From here select 'Refresh value'. A refresh read of the assigned parameter is then performed. Progress of this transaction is indicated by the pending flag in the Variable Editing area and an action on the communication progress bar. In the context menu the option 'Refresh Group' is additionally listed and this will prompt a refresh read of all variables in the Function Group

7.14 Monitoring Dynamic Device Variables

FF process variables associated with the measuring point are displayed through the application Header

Bar. Specifically, the menu displays the dynamic variables available from the device, with those variables currently being displayed by the header highlighted with a tick. Tapping the variables in the context menu either adds or removes them to/from the header display (depending on their current state). The variables are periodically refreshed from the device, at a default polling rate of 5 sec intervals. This rate may be configured by the user. See configuration options

7.15 Settings - misc. application settings

Location - Configuration >> Misc tab. Here user preferences for FF can be set. There are 2 categories of settings

7.15.1 Dynamic

- **Poll header every** - Set the refresh rate for the device variables displayed in the header
- **Poll all dynamic every** - Set the refresh rate for FF dynamic variables in the function group view (note this setting only becomes valid if the function group option **Refresh Vars On** is active)

7.15.2 Flags

- **Confirm Device Commits** - This setting if checked brings up a confirmation dialog before every write is committed to the field device. After installation the default setting is 'checked'
- **Display Invalidated Settings** - This setting if checked shows variable menus that are masked by the current configuration of the device. After installation the default setting is 'unchecked'
- **Read tags on Device Scan** - This setting if checked reads the tags of the field device on initial scan. After installation the default setting is 'checked'
- **Enable Value Range Checking** - This setting if checked ensures that all variable edits are within the limits specified by the device. After installation the default setting is 'checked'
- **Enable Device Library Monitor** - This setting if checked ensures enables the automatic check of the Open Field Communications DD library on application start up for new Device Descriptions. Note this configuration option requires a network path to the Internet. After installation the default setting is 'checked'

7.16 Altering the Header Polling Rate

Header polling rate can be adjusted as follows. Go to application environment menu **Configuration >> Options** and adjust the **Header poll rate** to the time required in seconds. Confirm with **OK** and return to the required application view

Location - **Configuration >> Options** tab

- **Poll header every** - Set the refresh rate for the device variables displayed in the header

7.17 Setting 'Library'

Location - **Configuration >> Device Library** tab

The library tab shows the Device Descriptions (DDs) that are currently on the Windows Mobile® device. This allows the user to browse for a specific device to determine that there is support for it

7.18 Scanning over H1 Connections

The following steps describe how to scan for FF devices on a H1 segment

1. Make sure CH2 is connected to a H1 segment
2. Start the FF application
3. Tap **Scan**
4. Select the connection method you wish to use (e.g. 'FF-H1') that you wish to use. If the required connection is not shown it will need to be configured
5. Tap the **Scan** button
6. The ‘scanning’ progress dialog view will open. Any devices found in the selected range will appear in the bus tree window list - All scanned devices are shown as a bold icon with an associated tag. Previous scan results are indicated in grey. When the current Scan confirms the device is present once more then the icon will change to bold blue with the associated device tag

Note: the search may be cancelled/terminated at any time by tapping the Cancel button. If cancelled, the current search results are retained

7. A single tap on any device in the search results will initiate connection to the **Device Detail view**. In this view the specific information of the device is shown. On **entering Detail view** FF will then load the Blocks of the target field device and make them available for parameterization

8. If in the **Detail view** a **Block** is selected and there is no corresponding **Device Deception (DD)** in the FF Device Description library a prompt will ask if the specific DD should be downloaded from the Open Field Communications DD server. Access to this server depends on the license privileges of the current user

7.19 Troubleshooting

If no device is found check:

- Field wiring. Specifically that the electrical segment connections are in accordance with the specific manual supplied with the field device and segment coupler / power

- The loop is not suffering from interference due to, unstable voltage supply from the segment power supply and / or electrical interference from other electrical equipment in close proximity or otherwise impacting the

8 Calibration Procedures

Note: GE Measurement and Control can provide a calibration service that is traceable to international standards

Note: GE Measurement and Control recommend returning the instrument to the manufacturer or an approved service agent for calibration. If using an alternative calibration facility, check that it uses the standards that follow.

8.1 Before Starting

Use only original parts supplied by the manufacturer. To do an accurate calibration, use the following:

- Calibration equipment specified in Table 8-1
- Stable temperature environment: 21 ± 1°C (70 ± 2°F)

Before starting a calibration procedure, it is recommended leaving the equipment in the calibration environment for a minimum of two hours

Table 8-1

Function	Calibration equipment (ppm = parts per million)	
Current (CH1 or CH2)	Current (mA) calibrator. Accuracy - Current measure/source, refer to Table 8-2 or Table 8-3	
Voltage (CH1 or CH2)	Volts calibrator. Accuracy - Voltage measure/source, refer to Table 8-5 or Table 8-7	
Millivolts (CH1 or CH2) OR TC mV (CH1)	mV calibrator. Accuracy - Millivolts measure/source, refer to Table 8-4 or Table 8-6 Accuracy - TC mV refer to Table 8-14	
Frequency (CH1)	**measure**	**source**
	Signal generator Total error: 0.3 ppm or better	Frequency meter Total error: 0.3 ppm or better Resolution: 8 digits (minimum)
Resistance (CH1)	**measure**	**source**
	Standard resistor 100R, 200R, 300R, 400R, 1k, 2k, 4k Total uncertainty: 20 ppm	An ohmmeter or an RTD measurement system with the specified excitation currents, refer to Table 8-13

Function	Calibration equipment (ppm = parts per million)
Cold Junction (CH1)	Calibrated K type thermocouple Accuracy: 50 mK for -5 to 28°C (23 to 82.4°F)
	Thermocouple temperature reference unit (0°C) Accuracy: 30 mK
AC mV (CH1)	AC mV calibrator. Accuracy - AC mV measure, Refer to Table 8-15
AC Volts (CH1)	AC Volts calibrator. Accuracy - AC Volts measure, Refer to Table 8-16
Pressure (P1 or P2)	Genii Module Carrier MC620G or Genii Pressure Base PV62XG: **Range 25 mbar/0.36 psi**: total uncertainty of 0.015% reading or better **Ranges > 25 mbar/0.36 psi**: total uncertainty of 0.01% reading or better
IDOS	UPM only. Refer to the user manual for the IDOS UPM.

Before starting the calibration, check the time and date on the instrument are correct

To do a calibration on a measure or source function, use the advanced menu option. Dashboard > Advanced > Calibration > Enter PIN 4321 > Perform Calibration

Then select a function and start the calibration:

1. Select channel
2. Select function
3. Select range (if applicable)
4. Follow on-screen instructions

When the calibration is complete, set the next calibration date

8.2 Procedures (CH1/CH2): Current (measure)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Use the calibration menu (Ref: Section 8.1) to do a three-point calibration (-FS, Zero and +FS) for each range: 20 mA and 55 mA

4. Check the calibration is correct
   - Select the applicable Current (measure) function, (Ref: Section 2.2, 2.7).
   - Apply the values that follow:

     mA: -55, -25, -20, -10, -5, 0 (open circuit)

     mA: 0, 5, 10, 20, 25, 55.

   - Check the error is in the specified limits (Ref: **Error! Reference source not found.**)

Table 8-2 Current (measure) error limits

Applied mA	Calibrator uncertainty (mA)	Permitted DPI 620 error (mA)
±55	0.003	0.0055
±25	0.0025	0.0040
±20	0.00063	0.0022
±10	0.00036	0.0016
±5	0.00025	0.0013
0 (open circuit)	0.0002	0.0010

8.3 Procedures (CH1/CH2): Current (Source)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref:Table 8-1):
    - CH1/CH2 (24 mA range): (Ref: Section 2.2 and Section 2.7)
    - CH2 (-24 mA range only):): (Ref: Section 2.2 and Section 2.7)
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Use the calibration menu (Ref: Section 8.1) to do a two-point calibration (0.2 mA and FS):
    - CH1 (one range): 24 mA
    - CH2 (two ranges): 24 mA (reverse) and 24 mA (forward)

    Note: Input positive values for the forward and reverse calibration

4. Check the calibration is correct:
    - Select the applicable Current (source) function; (Ref: Section 2.2, 2.7)
    - Apply the values that follow:
      CH1/CH2: 0.2, 6, 12, 18, 24
    - Check the error is within limits (Ref: Table 8-3)

Table 8-3 Current (source) error limits

Source mA	Calibrator uncertainty (mA)	Permitted DPI 620 error (mA)
±0.2	0.00008	0.0010
±6	0.00023	0.0016
±12	0.00044	0.0022
±18	0.0065	0.0028
±24	0.0012	0.0034

8.4 Procedures (CH1/CH2): DC mV/Volts (measure)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Use the calibration menu (Ref: Section 8.1) to do a three-point calibration
   (-FS, Zero and +FS) for the applicable set of ranges:

mV (measure) ranges	Volts (measure) ranges
200 mV	20 V
2000 mV	30 V

4. Check the calibration is correct:
   - Select the applicable Millivolts or Voltage (measure) function. (Ref: Section 2.3)
   - Apply the input values that are applicable to the calibration:

     mV: -2000, -1000, -200, -100, 0 (short circuit)
     mV: 0, 100, 200, 1000, 2000
     Volts (V): -30, -21, -20, -10, -5, 0 (short circuit)
     Volts (V): 0, 5, 10, 20, 21, 30.

- Check the error is within limits (Ref: Table 8-1 or Table 8-5
)

Table 8-4 Millivolts (measure) error limits

Applied mV	Calibrator uncertainty (mV)	Permitted DPI 620 error (mV)
±2000	0.051	0.14
±1000	0.040	0.1
±200	0.0051	0.017
±100	0.0040	0.0125
0 (short circuit)	0.0036	0.008

Table 8-5: Voltage (measure) error limits

Table 8-5 Voltage (measure) error limits

Applied V	Calibrator uncertainty (V)	Permitted DPI 620 error (V)
±30	0.00052	0.0021
±21	0.0004	0.0018
±20	0.00031	0.0009
±10	0.00016	0.00065
±5	0.00008	0.00053
0	0.000024	0.0004

8.5 Procedures (CH1): DC mV/Volts (source)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Use the calibration menu (Ref: Section 8.1) to do a two-point calibration (Zero and +FS) for the applicable range:

mV (source) ranges	Volts (source) ranges
2000 mV	20 V

4. Check the calibration is correct:
   - Select the applicable Millivolts or Voltage (measure) function (ref Section 2.6). Apply the input values that are applicable to the calibration:

     mV: 0, 100, 200, 1000, 2000
     Volts (V): 0, 5, 10, 15, 20.

   - Check the error is within limits (Ref: Table 8-6 or Table 8-7)

Table 8-6 millivolts (source) error limits

Source mV	Calibrator uncertainty (mV)	Permitted DPI 620 error (mV)
0	0.0001	0.008
100	0.00046	0.0125
200	0.0009	0.017
1000	0.003	0.1
2000	0.006	0.14

Table 8-7 Voltage (source) error limits

Source V	Calibrator uncertainty (V)	Permitted DPI 620 error (V)
0	0.000004	0.00042
5	0.000019	0.0007
10	0.000034	0.00010
15	0.000049	0.00013
20	0.000064	0.0016

8.6 Procedures (CH1): Frequency (measure/source)

Only do one frequency calibration, use either the measure function or the source function.

Frequency calibration (measure function)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Set-up the equipment as follows:

Signal generator:	Output = 10V, unipolar, square wave Frequency = 990 Hz
Druck DPI 620 Genii:	Input units = Hz Input trigger level = 5 V

4. Use the calibration menu (Ref: Section 8.1) to do a one-point calibration
5. Check the calibration is correct

Frequency calibration (source function)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1).
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Set-up the equipment as follows:

Frequency meter:	Gate time = one second
Druck DPI 620 Genii:	Waveform = Square; Amplitude = 10 V Frequency = 990 Hz

4. Use the calibration menu (Ref: Section 8.1) to do a one-point calibration
5. Check the calibration is correct

Frequency calibration check

- Frequency (measure) calibration check

Signal generator:	Output = 10 V unipolar square wave
Druck DPI 620 Genii:	Input trigger level = 5 V Units: Hz or kHz as specified in Table 8-8 or Table 8-9

- Frequency (source) calibration check

Frequency meter:	Gate time = one second
Druck DPI 620 Genii:	Units: Hz or kHz as specified in Table 8-8 or Table 8-9

- Select the applicable Millivolts or Voltage (measure) function (ref Section 2.8). Apply the input values:

Hz:	0, 990
kHz:	10, 50

- Check the error is within limits (Ref: Table 8-8 or Table 8-9)

Table 8-8 Hz error limits (measure/source)

Measure/ source Hz	Calibrator uncertainty (Hz)	Permitted DPI 620 error (Hz)	
		(measure)	(source)
100	0.0002	0.0023	0.0026
990	0.0005	0.0050	0.0053

Table 8-9 kHz error limits (measure/source)

Measure/ source kHz	Calibrator uncertainty (kHz)	Permitted DPI 620 error (kHz)	
		(measure)	(source)
10.0000	0.00002	0.00023	0.000067
50.0000	0.00002	0.00035	0.000185

8.7 Procedures (CH1): Frequency Amplitude (source)

Do the procedure as follows:

Note: The procedure that follows calibrates the “mark” value of the square ware frequency output. The “space” value is fixed and is approximately -120 mV

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Set-up the equipment as follows:

   Source frequency = 0 (For DC output);
   Waveform = Square

4. Use the calibration menu (Ref: Section 8.1) to do a two-point calibration.

   Point 1 = 0.2 V, point 2 = 20 V

5. Check the calibration is correct.
   - Set-up the equipment as follows:
     Source frequency = 0 (For DC output);
     Waveform = Square
   - Apply the amplitude values that are applicable to the calibration (Ref: Table 8-10)
   - Check the error is within limits (Ref: Table 8-10)

Table 8-10 Amplitude (source) error limits

Amplitude Volts (V)	Calibrator uncertainty (V)	Permitted DPI 620 error (V)
0.2	0.01	0.1
5.0	0.01	0.1
10.0	0.01	0.1
20.0	0.01	0.1

8.8 Procedures (CH1): Resistance measure)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Use the calibration menu (Ref: Section 8.1) to do a two-point calibration

Range: 0-400Ω

- Nominal zero ohms:
  Make a 4-wire connection to the 0Ω
- Nominal positive full-scale ohms
  Make a 4-wire connection to the 400 Ω resistor

Range: 400Ω-4kΩ

- Nominal 400Ω
  Make a 4-wire connection to the 400Ω resistor
- Nominal positive full-scale ohms
  Make a 4-wire connection to the 4k resistor

4. Check the calibration is correct
   - Select the applicable Resistance (measure) function (Ref Section 50)
   - Make a 4-wire connection to the applicable standard resistor (Ref:Table 8-11) and measure the value
   - Check the error is within limits (Ref: Table 8-11)

Table 8-11 Resistance (measure) error limits

Standard Resistor (Ω)	Resistor uncertainty (Ω)	Permitted DPI 620 error (Ω)
0 (short	-	0.02
100	0.002	0.032
200	0.004	0.044
300	0.006	0.056
400	0.008	0.068
1000	0.02	0.30
2000	0.04	0.41
4000	0.08	0.64

8.9 Procedures (CH1): True Ohms (measure)

Do the procedure as follows:

1. Repeat procedure 8.8; in step 3 and 4 select True Ohms
2. Check the error is within limits (Ref: Table 8-1)

Table 8-12 True Ohms (measure) error limits

Standard Resistor (Ω)	Resistor uncertainty (Ω)	Permitted DPI 620 error (Ω)
0 (short circuit)	-	0.004
100	0.002	0.0095
200	0.004	0.015
300	0.006	0.0205
400	0.008	0.026
1000	0.02	0.059
2000	0.04	0.114
4000	0.08	0.224

8.10 Procedures (CH1): Resistance (source)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)

2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)

3. Use the calibration menu (Ref: Section 8.1) to do a two-point calibration, for each range
   - Range: 0-400 Ω
   - Range: 400Ω -2000Ω
   - Range: 2kΩ -4kΩ

4. Check the calibration is correct:

   - Select the Resistance (source) function (ref section 2.9)
   - Apply the resistance values that are applicable to the calibration (Ref: Table 8-13)
   - Check the error is within limits (Ref: Table 8-13)

Table 8-13 Resistance (source) error limits

Ohms (Ω)	Excitation (mA)	Calibrator uncertainty (Ω)	Permitted DPI 620 error (Ω)
0	0.1	0.0014	0.014
100	0.1	0.0016	0.038
200	0.1	0.0021	0.062
300	0.1	0.0028	0.086
400	0.1	0.0035	0.11
1000	0.1	0.008	0.31
2000	0.1	0.016	0.55
3000	0.1	0.024	0.86
4000	0.1	0.032	1.1

8.11 Procedures (CH1): TC mV (measure or source)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Let the equipment get to a stable temperature (minimum: 5 minutes `since the last power on)
3. Use the calibration menu (Ref: Section 8.1) to do a three-point calibration
   (-10 mV, Zero and 100 mV) for the measure or source function
4. Check the calibration is correct:
   - Select the applicable TC mV (measure) or (source) function (ref Section 2.10)
   - Apply the necessary values
   - TC mV (measure): -10, 0 (short circuit)
   - TC (mV): 10, 25, 50, 100
   - TC mV (source): -10, 0, 10, 25, 50, 100

- Check the error is within limits (Ref: Table 8-14)

Table 8-14 TC mV (measure or source) error limits

Input or output	Calibrator uncertainty TC (mV)		Permitted DPI 620 error (mV)	
TC (mV)	(measure)	(source)	(measure)	(source)
-10	0.0036	0.00011	0.0085	0.0090
0	0.0036	0.0001	0.008	0.008
10	0.0036	0.00011	0.0085	0.0090
25	0.0036	0.00015	0.0091	0.0100
50	0.0037	0.00025	0.010	0.0125
100	0.004	0.00046	0.0125	0.0170

8.12 Procedures (CH1): Cold Junction (TC method) and CJ (measure)

Note: Do the TC mV (measure) calibration before the cold junction calibration. The conditions for CJ calibration are as follows:

- Battery mode (with DC charger disconnected)
- CH1 active
- CH2 set to “None”
- Burnout Detection off
- Use miniature TC connectors

There are two methods of doing a cold junction test; the CJ (TC Method) is the preferred method both procedures are described as follows

CJ (TC Method)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref:Table 8-1)
2. Set the reference unit temperature: 0°C
3. Let the equipment get to a stable temperature (minimum: 1 hour since the last power on)
4. Use the calibration menu (Ref: Section 8.1) to do a one-point calibration for the CJ (TC method) function
5. Calculate the expected reading, using the known error in the thermocouple and reference unit
6. Check the calibration is correct
    - Select the TC measure function (ref section 2.10)
    - Check the equipment gives a TC temperature that is the same as the temperature on the reference unit ±0.1°C (0.2°F), after correction for the known thermocouple and reference unit error

CJ

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Set-up the equipment
    - Function = TC (measure)
    - TC Type = K Type
    - CJ Compensation, Mode = Automatic
3. Set the reference unit temperature: 0°C
4. Let the equipment get to a stable temperature (minimum: 1 hour since the last power on)
5. Record the values that follow:
    - TC temperature given on the reference unit T (actual)
    - TC temperature given on the calibrator, T (measured)
    - CJ temperature given on the calibrator, CJ (measured)
6. Calculate the CJ (Cal Value) as follows:
    - CJ (Cal Value) = CJ (measured) - T (actual) + T (measured)
    - Use the calibration menu to do a one-point calibration for the CJ (measure) function
    - When the display shows “Sampling complete”, set the correct Cal Value = CJ (Cal Value) above

7. Check the calibration is correct
    - Select the TC (measure) function
8. Check the equipment gives a TC temperature that is the same as the temperature on the reference unit ±0.1°C (0.2°F)

8.13 Procedures (CH1): AC mV/Volts (measure)

Do the procedure as follows:

1. Connect the applicable calibration equipment (Ref: Table 8-1)
2. Let the equipment get to a stable temperature (minimum: 5 minutes since the last power on)
3. Use the calibration menu (Ref: Section 8.1) to do a two-point calibration for the applicable AC function
    - Use the local power supply frequency
    - For the AC mV (measure) function:
        point 1 = 200.0 mVAC,
        point 2 = 2000.0 mVAC
    - For the AC Volts (measure) function:
        point 1 = 2.000 AC,
        point 2 = 20.000 VAC

4. Check the calibration is correct
   - Select the applicable AC mV or AC Volts (measure) function (ref Section 2.5)
5. Apply the input values that are applicable to the Calibration
   - AC mV: 10, 500, 1000, 2000
   - AC Volts: 5, 10, 20
6. Check the error is within limits (Ref: Table 8-15 or Table 8-16)

Table 8-15 AC mV (measure) error limits

Applied AC mV	Calibrator uncertainty (mV)	Permitted DPI 620 error (mV)
10	0.12	2.5
500	0.2	3.1
1000	0.28	3.75
2000	0.44	5.0

Table 8-16 AC Volts (measure) error limits

Applied AC Volts	Calibrator uncertainty	Permitted DPI 620 error
5	0.0018	0.03
10	0.0026	0.037
20	0.0042	0.050

8.14 Procedures: Pressure Indicator Modules (PM 620)

Do the procedure as follows:

1. Assemble the pressure indicator with the necessary PM620 modules
2. Connect the instrument to the pressure standard
3. Let the equipment get to a stable temperature (minimum: 60 minutes since the last power on)
4. Use the calibration menu (Ref: Section 8.1) to do a two-point calibration

    - Zero and +FS for absolute sensors

    Note: If software version requires a three-point calibration for an absolute sensor, use points at 0, 50% and +FS or three-point calibration:
    - -FS, Zero and +FS for gage sensors
    - (Ref: Table 8-17)

Table 8-17 Calibration pressures

Ranges: gage	Nominal applied pressure mbar (psi)		
	-FS †	Zero	+FS
< 700 mbar (10.0 psi)	-FS	0	+FS
> 700 mbar (10.0 psi)	-900 (-13.1)	0	+FS
†For a three-point calibration, do not apply more than -90% of the specified FS for the unit.			
Ranges: absolute	Nominal applied pressure mbar (psi)		
	Zero		+F
350 mbar (5.00 psi)	< 1.0 (0.02)		+F
2 bar (30.0 psi)	< 5.0 (0.07)		+F
7 bar (100.0 psi)	< 20.0 (0.29)		+F
20 bar (300.0 psi)	< 50.0 (0.73)		+F
350 bar (5000 psi)	Use atmospheric pressure as zero.		+F S

5. Check the calibration is correct:
    - Select the applicable pressure function
    - Apply the following pressure values (absolute sensors)
    - 0, 20, 40, 60, 80, 100 (%FS)
    - Go back to 0 in the same steps
    - Apply the following pressure values (gage sensors
    - 0, 20, 40, 60, 80, 100 (%FS)
    - Go back to 0 in the same steps

6. Check the error is within limits (Ref: Table Gage Ranges and Absolute Ranges)

    - Gage ranges or absolute ranges tables (Ref: datasheet
    - Use the values in the total uncertainty column
    - The specified values include an allowance for temperature changes, reading stability for one year, and the uncertainty of the standard used for calibration

8.15 Procedures: IDOS UPM

(Ref: User manual IDOS UPM)

When the calibration is complete, the instrument automatically sets a new calibration date in the UPM

9 General Specification

9.1 Introduction

For a full specification of the Druck DPI 620 Genii calibrator and its related accessories (MC 620 carrier, PM 620 module and PV 62x pressure stations) refer to the relevant product datasheet.

The DPI 620 is suitable for indoor use with the following environmental requirements. It is permitted to use the DPI 620 outdoors as a portable instrument if the environmental requirements are met

Display	LCD: Color display with touch-screen
Operating temperature	-10 to 50°C (14 to 122°F)
Storage temperature	-20 to 70°C (-4 to 158°F)
Ingress Protection	IP55 (Druck DPI 620 Genii calibrator only)
Humidity	0 to 90% relative humidity (RH) non-condensing
Shock/Vibration	MIL-PRF-28800F for class 2 equipment
Pollution Degree	2
EMC	Electromagnetic compatibility: BS EN 61326-1:2006
Electrical safety	Electrical - BS EN 61010:2010
Pressure safety	Pressure Equipment Directive - Class: Sound Engineering Practice (SEP)
Approved	CE Marked
Battery power	Lithium-Polymer battery (GE Part number: 191-356) Capacity: 5040 mAh (minimum), 5280 mAh (typical), Nominal voltage: 3.7 V. Charge temperature: 0 to 40°C (32 to 104°F) outside this range, charging stops.

Note 1: The DPI 620 has been assessed to the European IEC60529 standard as having an ingress protection rating of IP55, but this is for reliability purposes and not for safety reasons

Note 2: To meet the immunity requirements of annex A of EN61326-1:2006, when used in an industrial environment, the unit must be battery powered to guarantee measurement specification

Note 3: The case of the DPI620 is not suitable for prolonged exposure to UV

Note 4: The DPI620 is not suitable for permanent installation in an outdoor environment

10 Manufacturer

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11 Display Icons

Table 11-1 Dashboard Icons

	Advanced		Hart®
	Calibrator		Help
	Data Logging		LED (shows which operation is active)
	Touchscreen		Multimeter
	Documenting		Scope
	Foundation Fieldbus		Settings
	Files		Status

Table 11-2:
Status Icons

	Battery		Pressure Base
	Battery Charging		Wireless
	HART®		

Table 11-3:
Button/Footer Icons

	Auto Rotate		Save File
	Back		Go
	Back Space		Graph Mode
	Home		Exit Log

Table 11-4:
Button/Footer Icons

	Previous Log		Next Log
	Nudge Down		Nudge Up
	More		Reset
	Start		Stop

Table 11-5:
Documenting Icons

	Analysis Parameter		Text Entry
	Channel Error		Channel Linearity
	Channel Scaling		Channel Tolerance

Table 11-6:
Documenting Icons

	Result as Found		Result as Left
	Reference High		Reference Low
	Start		Store Reading

Table 11-7:
List/Channel Icons

	Alarm		Channel USB
CH1	Channels	CH2	Channels
	Channel P1		Channel P2


Doc Adjust

Doc Cal


Doc Fail


Doc in Limits

Doc Linear


Doc Root


Documenting


Falling Relief Valve


Filter Light


Flow Light


Gate Closed


Gate Open


Measure Complete


Max/Min


Leak Test


Measure


Next


Previous


Channel Nudge


Play/Pause

Percent Step


Ramp


Relief Valve


Repeat


Resize


Rising Relief Valve


Sine Wave


Source

Table 11-8:
List/Channel Icons

	Span Check		Square Wave
	Bullet		Switch Actuate
	Switch De-actuate		Switch Initial State
	Switch Closed		Switch Open
	Switch Test		TARE
	Task		Triangular Wave

Table 11-9:
HART® Icons

	Abort		Commit
	New File		Close
	Comms Failed		Comms Off
	Comms On		Comms Start
	Down		UP
	Left		Right
	Tree Toggle		Navigation Toggle

Table 11-9:
HART® Icons

	Home		Settings
	Status		Dashboard
	Folder		Folder Selected
	Image		Online
	Method		Value
	Value List		
	Off		On

Table 11-10:
Fieldbus Icons

	Add Connect		Bridge
	Blue tooth		Pending
	Go to Desktop		Function
	Gateway		Generic
	H1 Device		Method
	Mobile		Information
	Open		Closed

Table 11-10:
Fieldbus Icons

	People		Error
	Resource		Search
	Unrecognized		