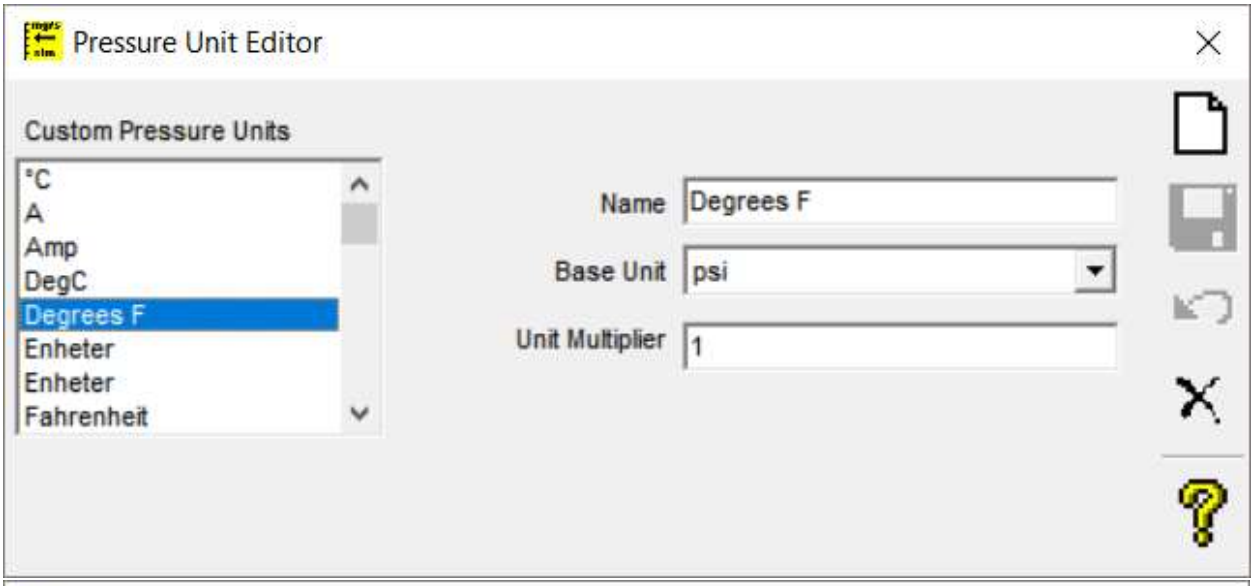
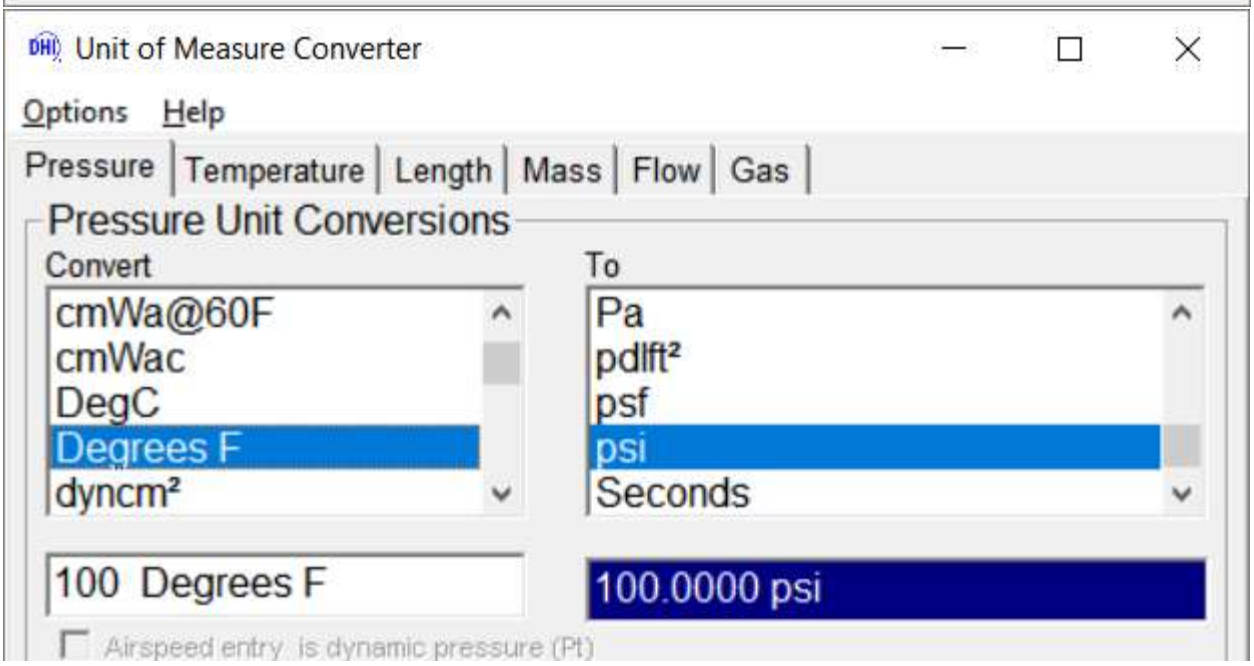
Temperature Calibration Setups

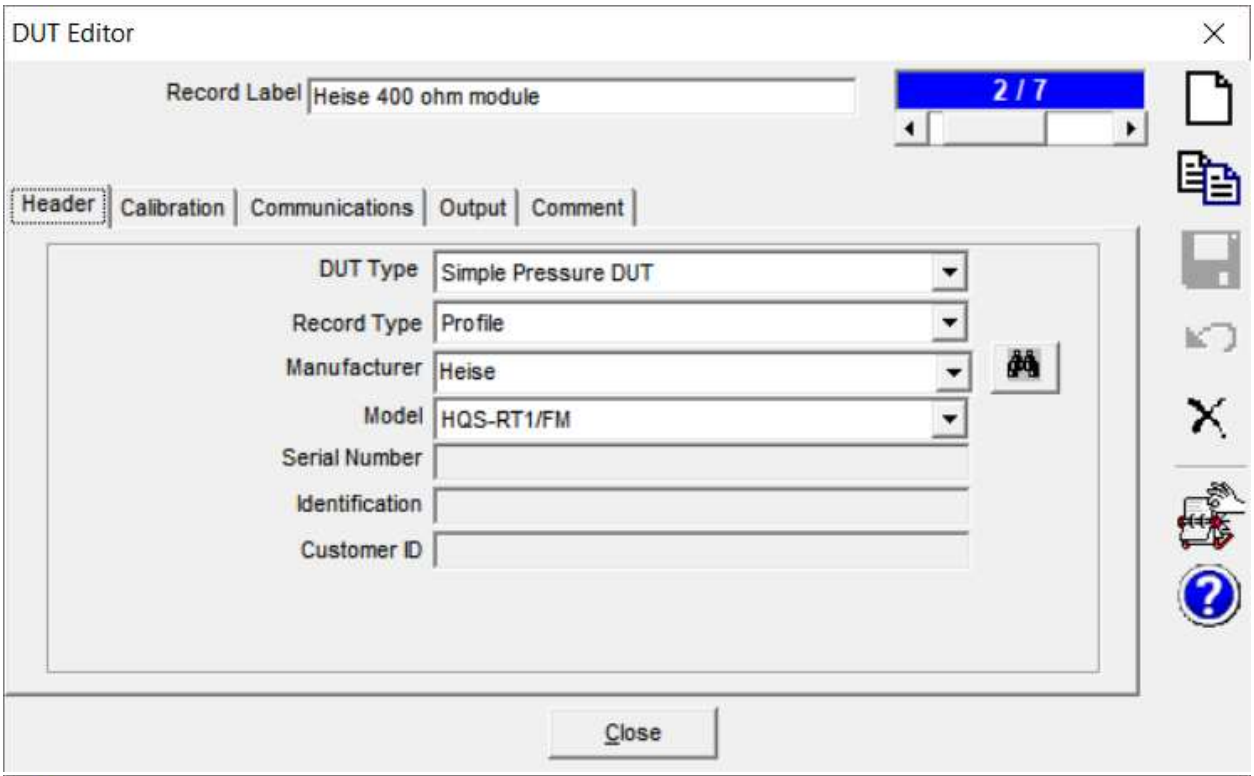
COMPASS v5.0.39
January 2018

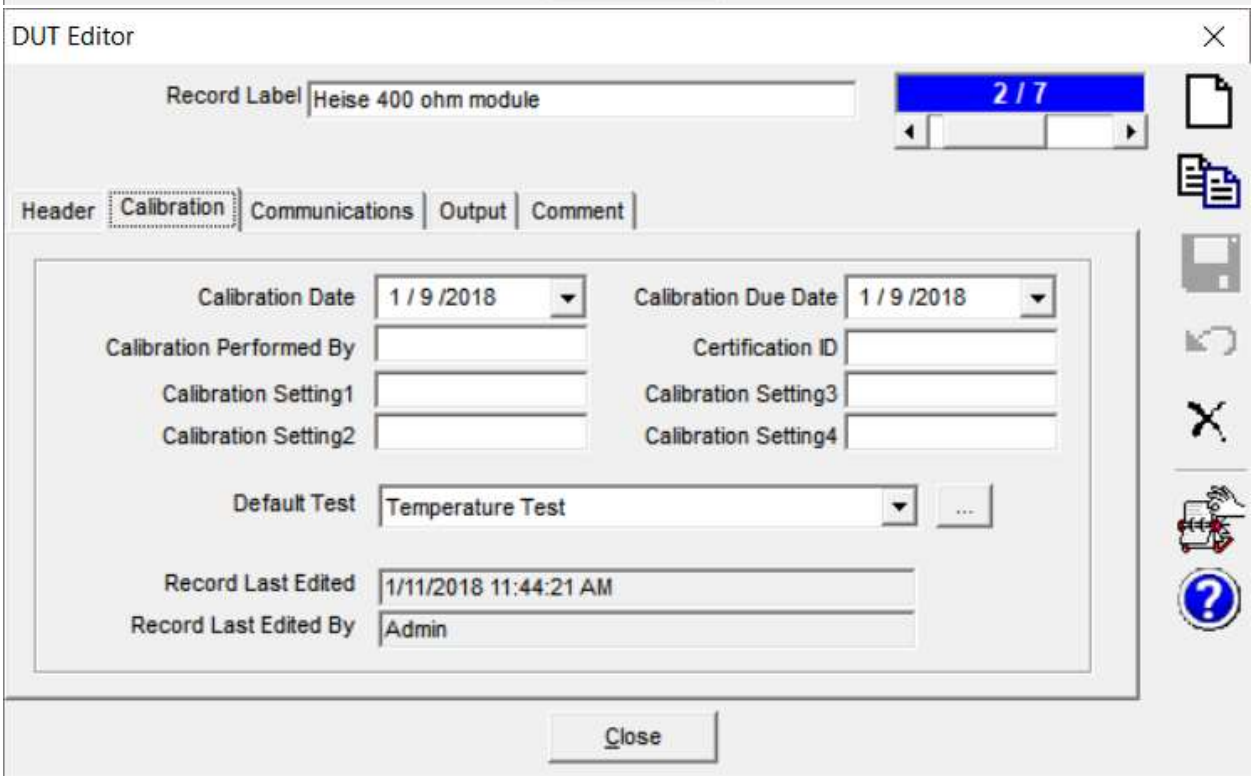
Create custom unit of measure for “Degrees F”. From the [Options] menu, select <Edit Custom Pressure Units> and then click on the “New” paper icon. In this example, 1 “Degrees F” is correlated to 1 psi of pressure. This is required as the temperature devices will be configured as pressure devices but using the custom unit of “Degrees F”.

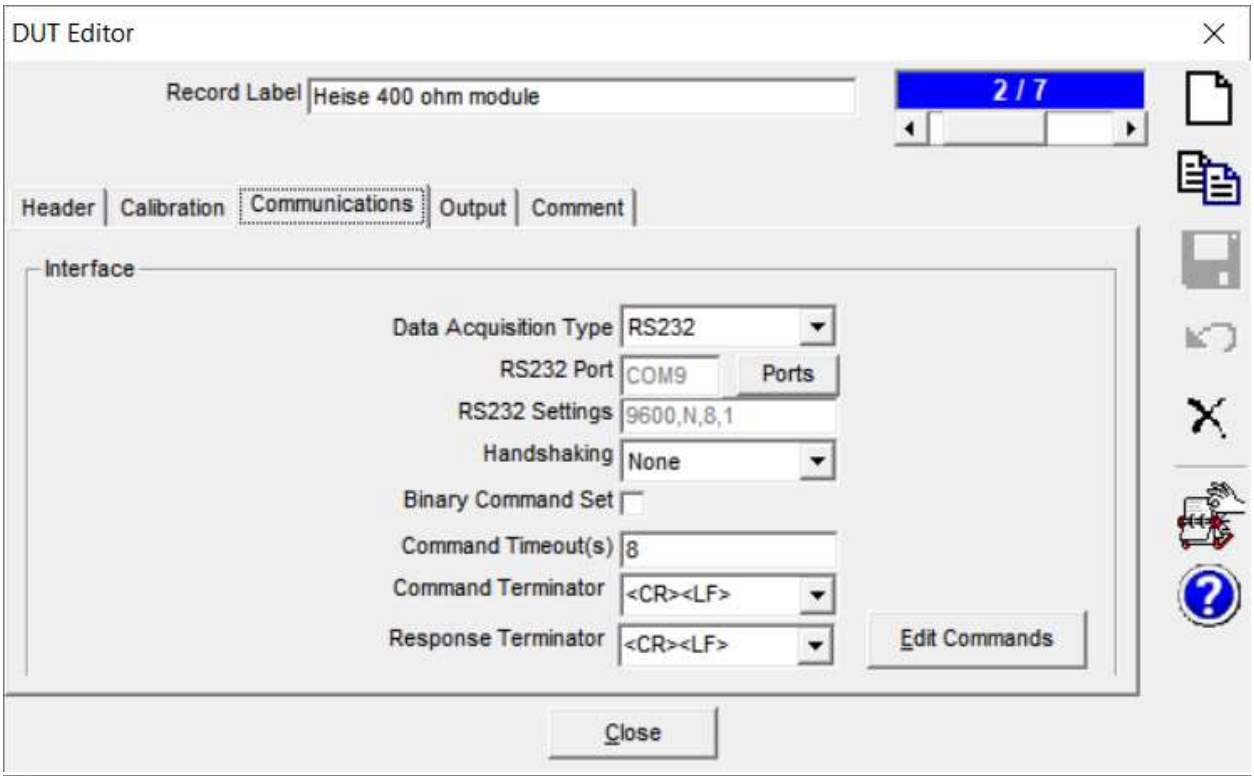


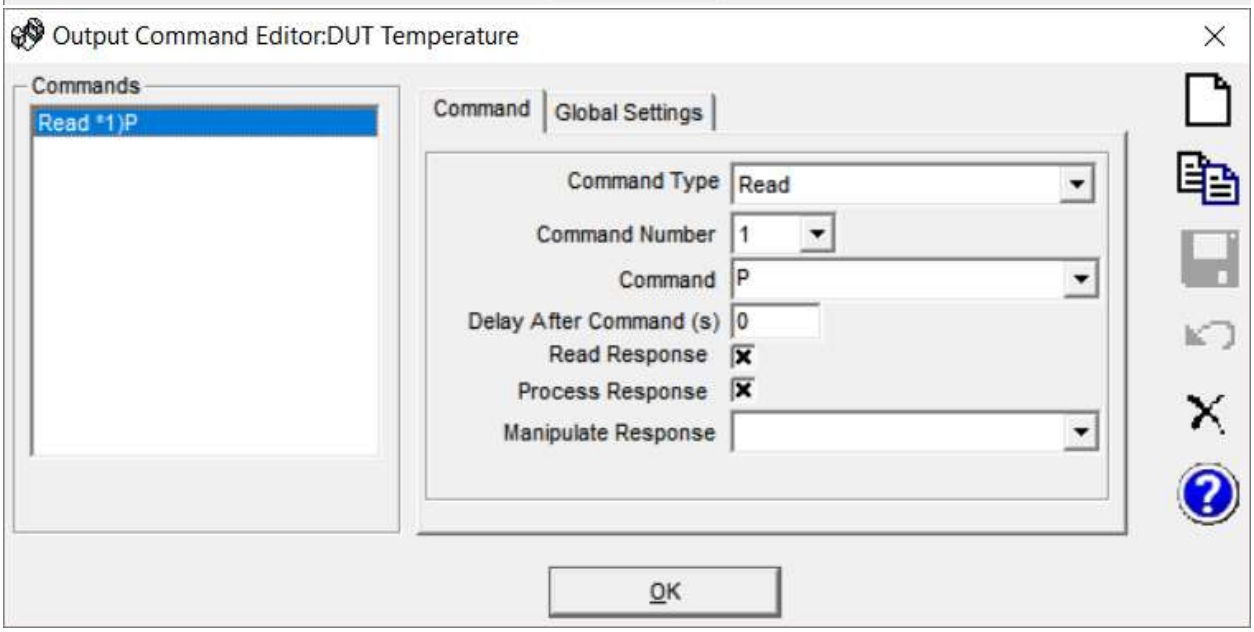


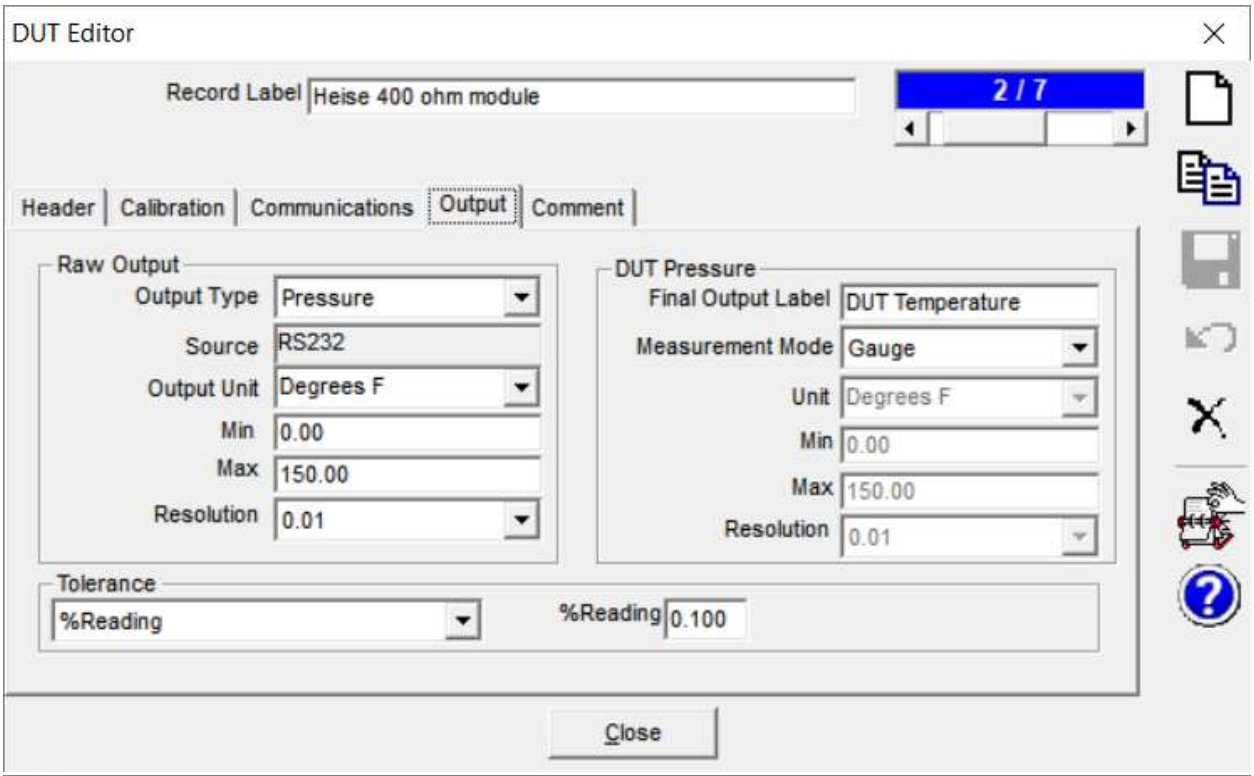
DUT:

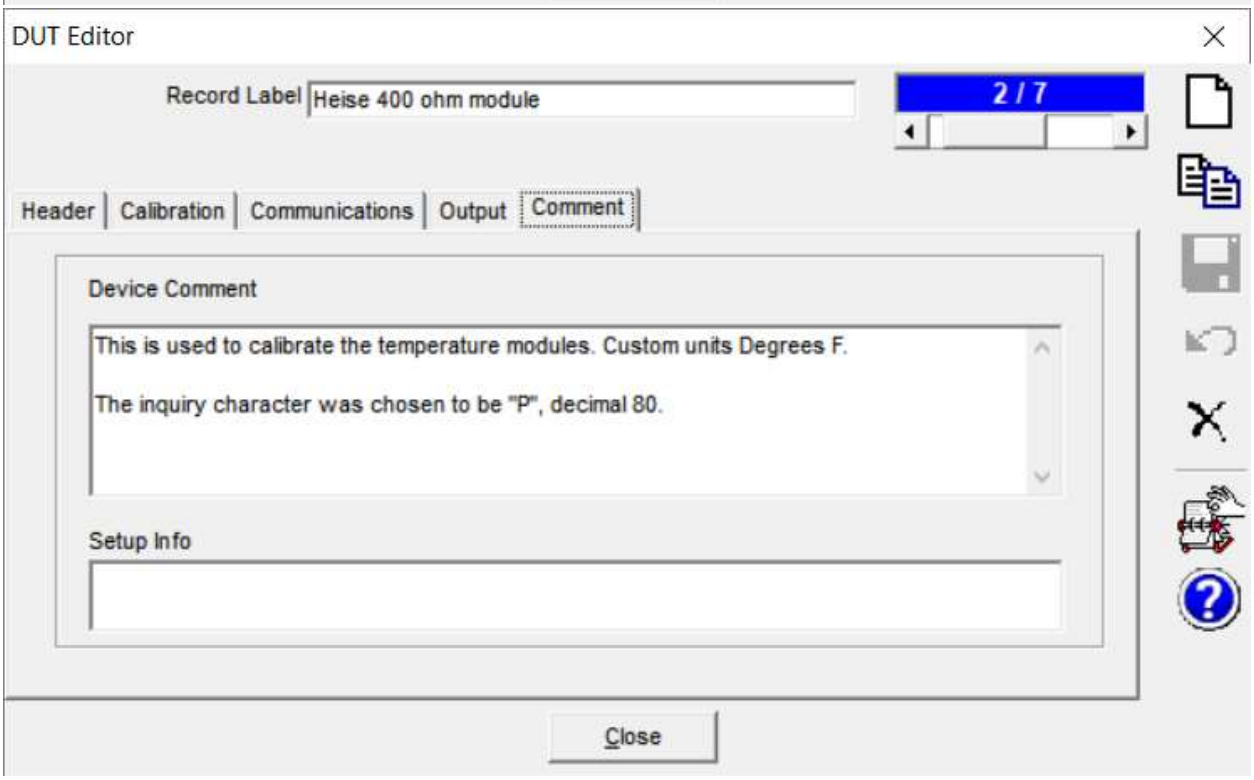

DUT Editor
Record Label
Heise 400 ohm module
2 / 7
Header
Calibration
Communications
Output
Comment
DUT Type
Simple Pressure DUT
Record Type
Profile
Manufacturer
Heise
Model
HQS-RT1/FM
Serial Number
Identification
Customer ID
Close


DUT Editor
Record Label
Heise 400 ohm module
2 / 7
Header
Calibration
Communications
Output
Comment
Calibration Date
1 / 9 /2018
Calibration Due Date
1 / 9 /2018
Calibration Performed By
Certification ID
Calibration Setting1
Calibration Setting3
Calibration Setting2
Calibration Setting4
Default Test
Temperature Test
Record Last Edited
1/11/2018 11:44:21 AM
Record Last Edited By
Admin
Close

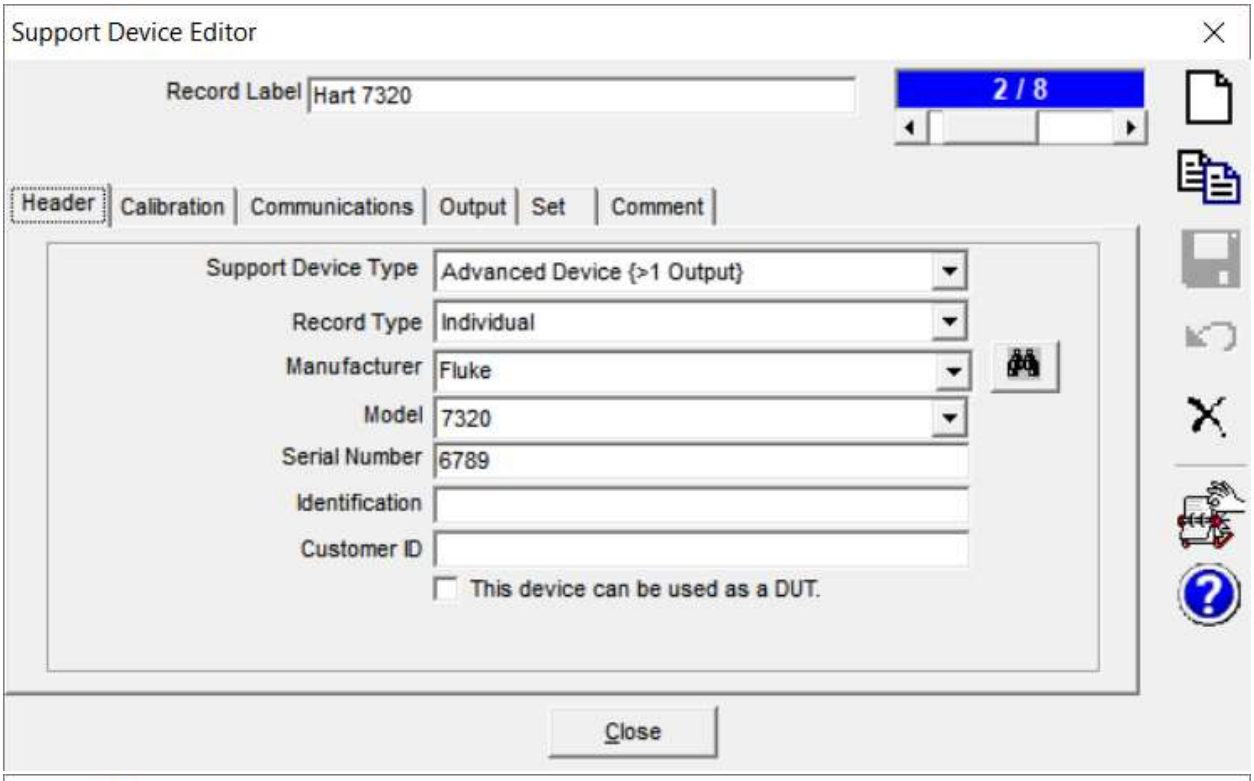

DUT Editor
Record Label
Heise 400 ohm module
2 / 7
Header
Calibration
Communications
Output
Comment
Interface
Data Acquisition Type
RS232
RS232 Port
COM9
Ports
RS232 Settings
9600,N,8,1
Handshaking
None
Binary Command Set
Command Timeout(s)
8
Command Terminator
<CR><LF>
Response Terminator
<CR><LF>
Edit Commands
Close


Output Command Editor:DUT Temperature
Commands
Read *1)P
Command
Global Settings
Command Type
Read
Command Number
1
Command
P
Delay After Command (s)
0
Read Response
Process Response
Manipulate Response
OK


DUT Editor
Record Label
Heise 400 ohm module
2 / 7
Header
Calibration
Communications
Output
Comment
Raw Output
Output Type
Pressure
Source
RS232
Output Unit
Degrees F
Min
0.00
Max
150.00
Resolution
0.01
DUT Pressure
Final Output Label
DUT Temperature
Measurement Mode
Gauge
Unit
Degrees F
Min
0.00
Max
150.00
Resolution
0.01
Tolerance
%Reading
%Reading
0.100
Close

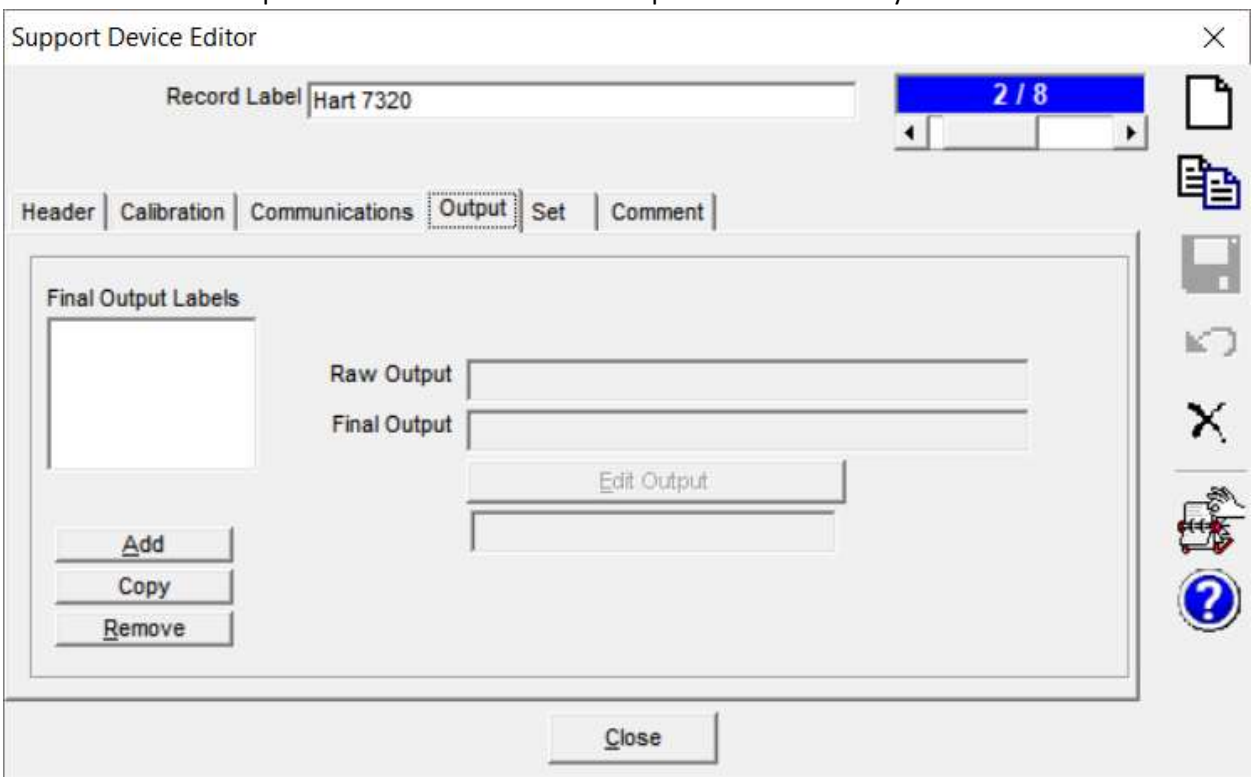

DUT Editor
Record Label
Heise 400 ohm module
2 / 7
Header
Calibration
Communications
Output
Comment
Device Comment
This is used to calibrate the temperature modules. Custom units Degrees F.
The inquiry character was chosen to be "P", decimal 80.
Setup Info
Close

7320 Bath:

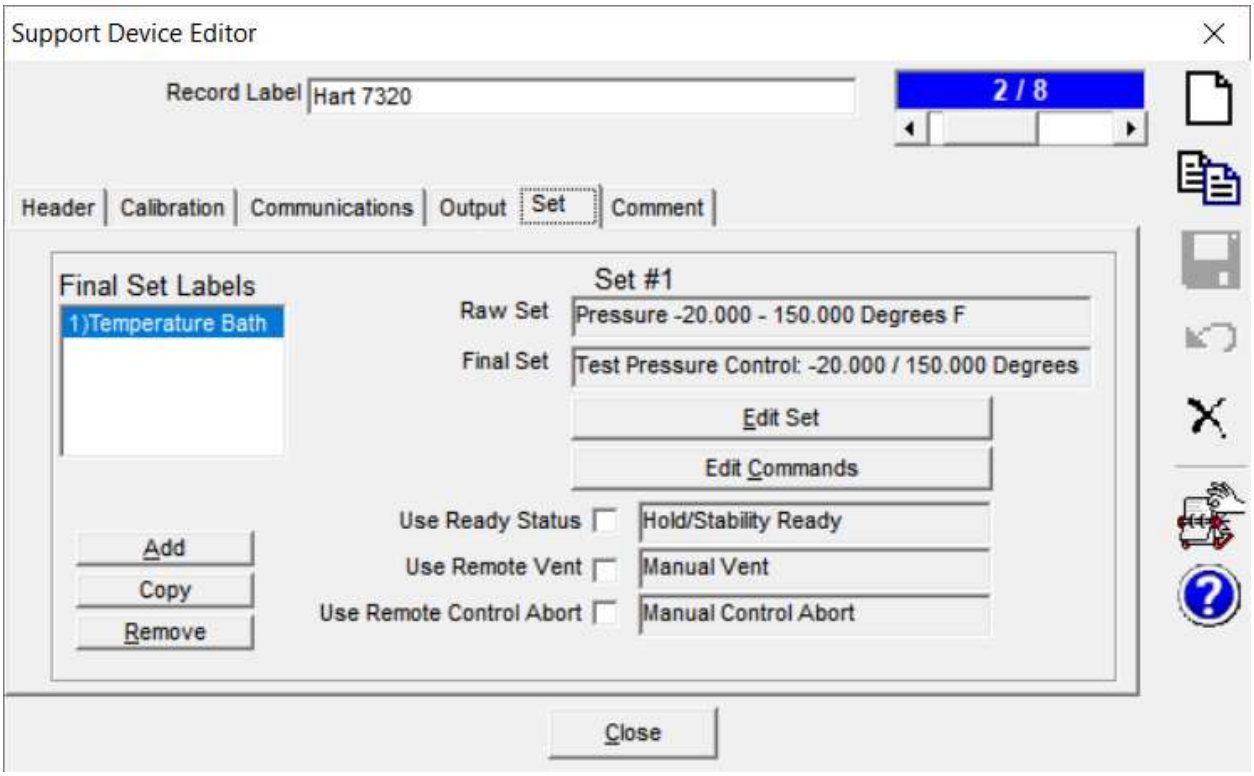

Support Device Editor
Record Label
Hart 7320
2 / 8
Header
Calibration
Communications
Output
Set
Comment
Support Device Type
Advanced Device {>1 Output}
Record Type
Individual
Manufacturer
Fluke
Model
7320
Serial Number
6789
Identification
Customer ID
This device can be used as a DUT.
Close

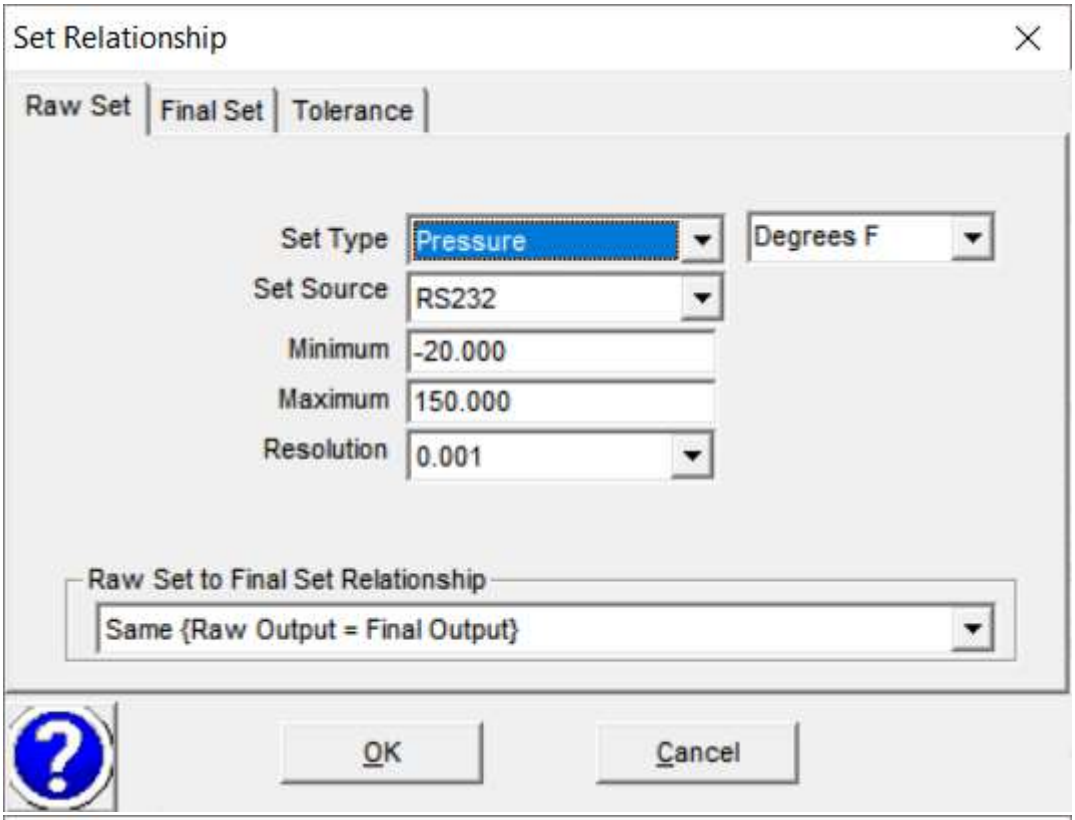

Support Device Editor
Record Label
Hart 7320
2 / 8
Header
Calibration
Communications
Output
Set
Comment
Common read and set interface.
Interface
Data Acquisition Type
RS232
RS232 Port
COM15
Ports
RS232 Settings
2400,N,8,1
Handshaking
None
Binary Command Set
Command Timeout(s)
8
Command Terminator
<CR>
Response Terminator
<CR><LF>
Close

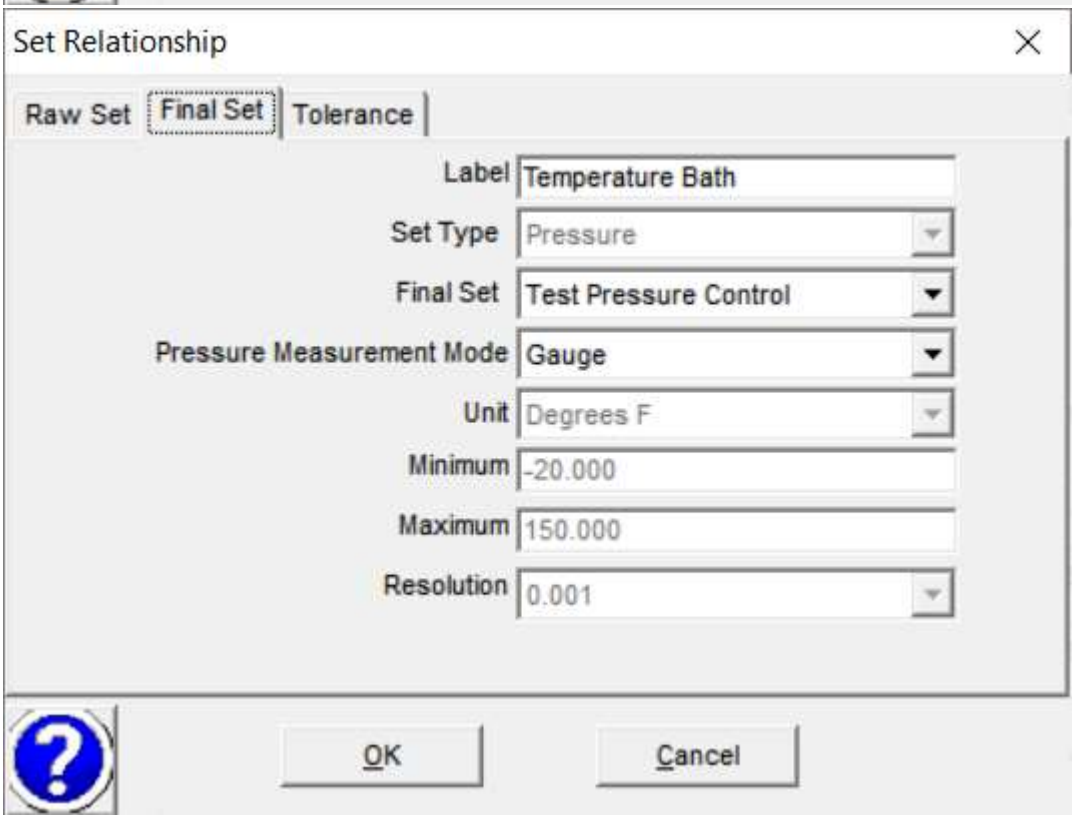
No measurement Output is used as the bath is for temperature control only.

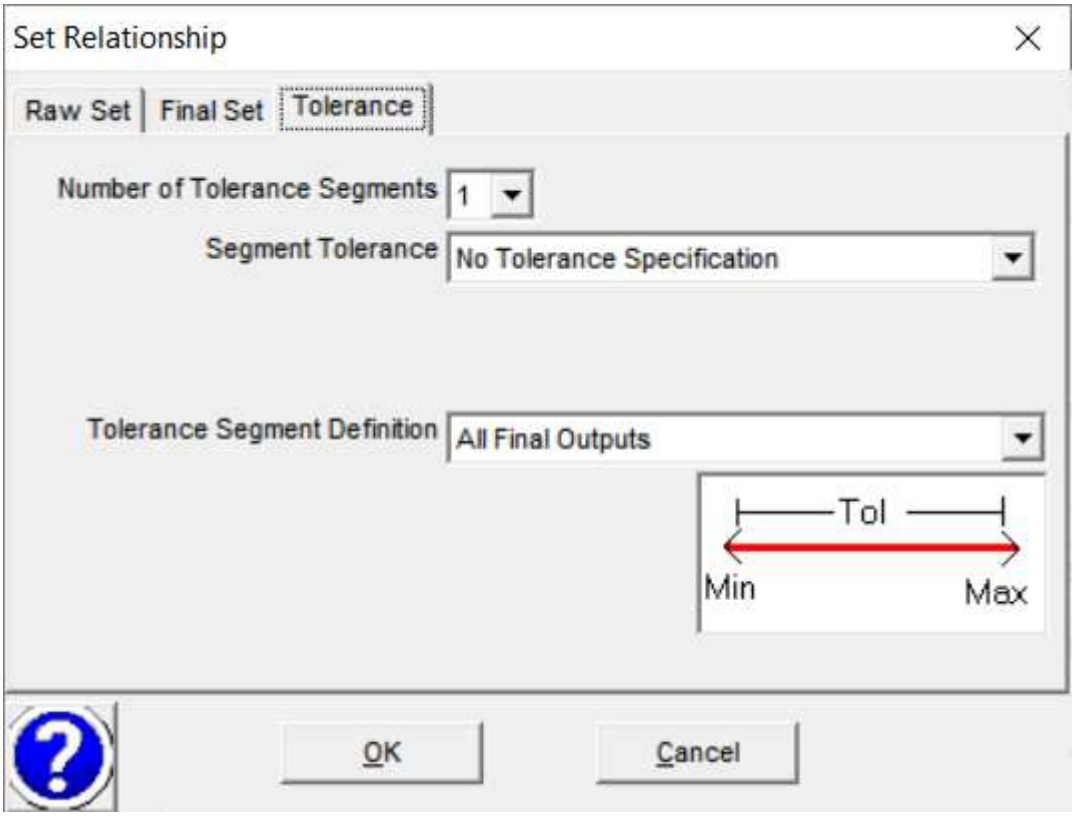


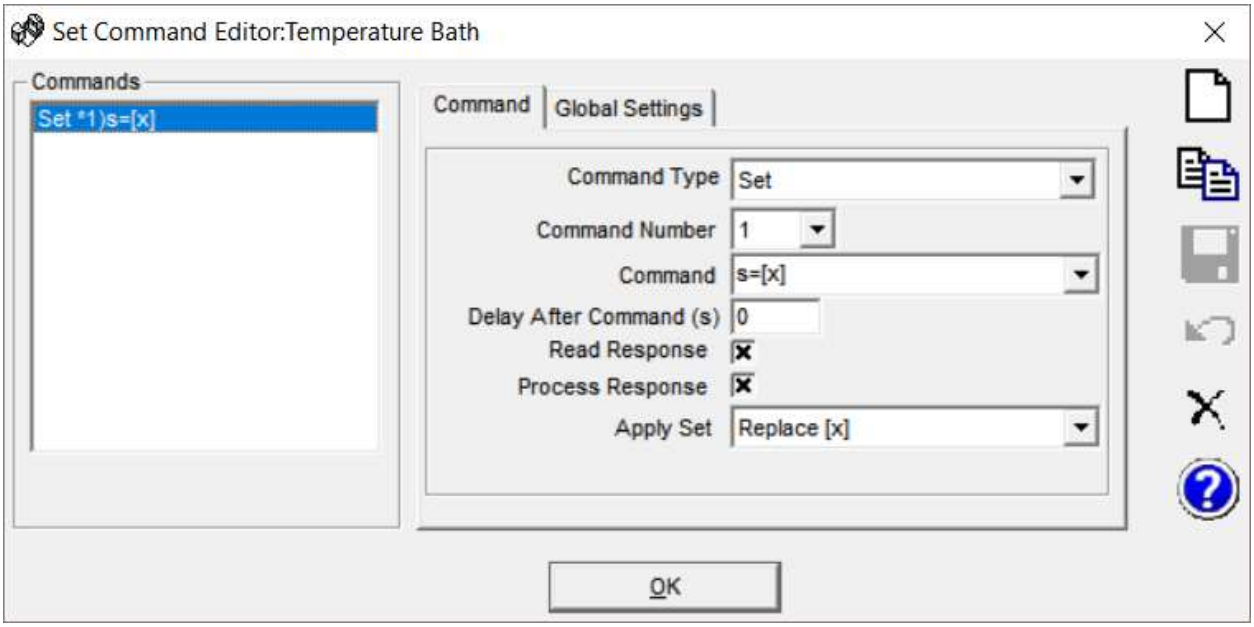
The Set is configured for controlling the bath:

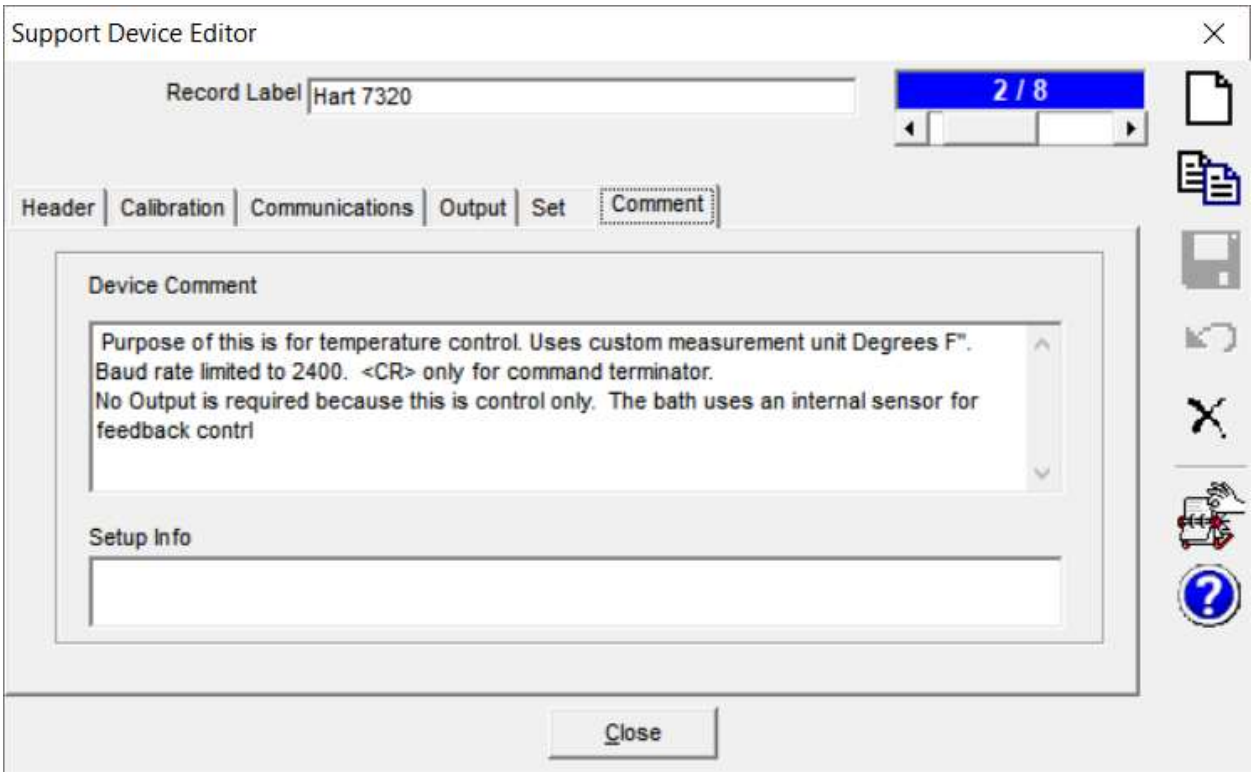



Set Relationship
Raw Set
Final Set
Tolerance
Set Type
Pressure
Degrees F
Set Source
RS232
Minimum
-20.000
Maximum
150.000
Resolution
0.001
Raw Set to Final Set Relationship
Same {Raw Output = Final Output}
OK
Cancel

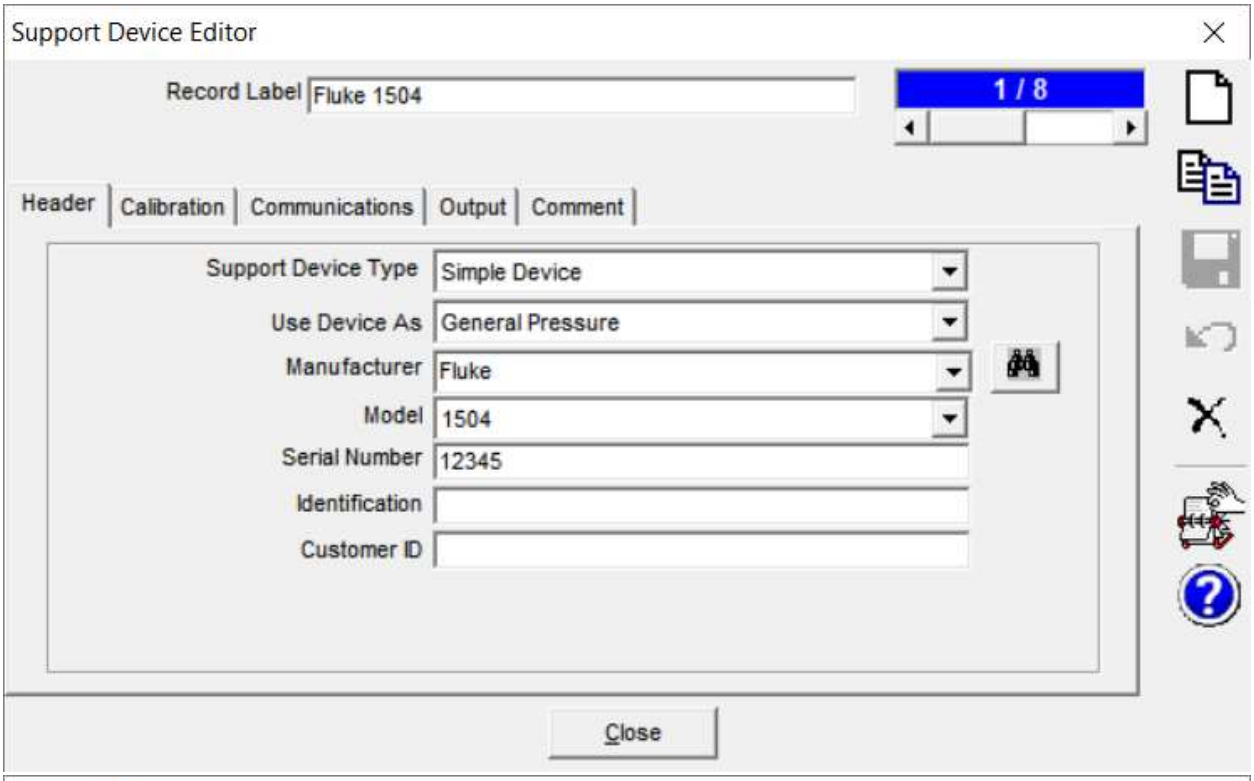

Set Relationship
Raw Set
Final Set
Tolerance
Label
Temperature Bath
Set Type
Pressure
Final Set
Test Pressure Control
Pressure Measurement Mode
Gauge
Unit
Degrees F
Minimum
-20.000
Maximum
150.000
Resolution
0.001
OK
Cancel

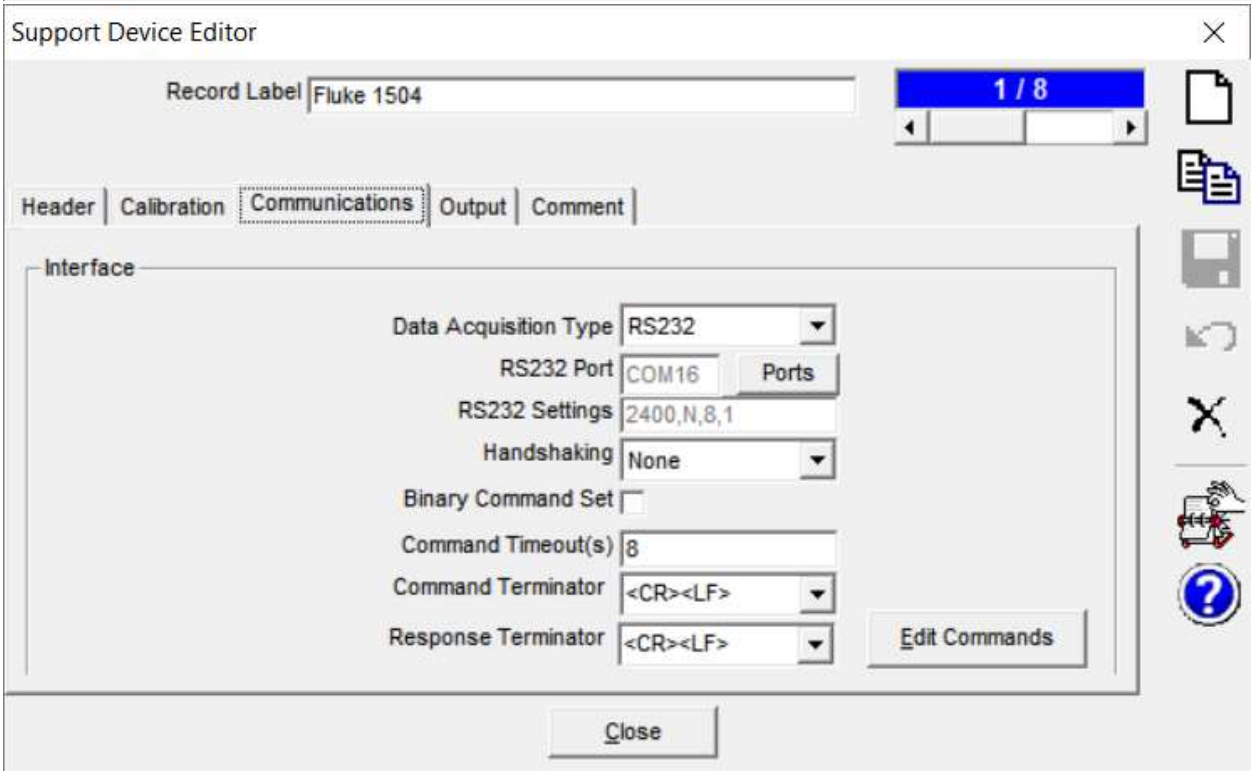

Set Relationship
Raw Set
Final Set
Tolerance
Number of Tolerance Segments
1
Segment Tolerance
No Tolerance Specification
Tolerance Segment Definition
All Final Outputs
Tol
Min
Max
OK
Cancel


Set Command Editor:Temperature Bath
Commands
Set *1)s=[x]
Command
Global Settings
Command Type
Set
Command Number
1
Command
s=[x]
Delay After Command (s)
0
Read Response
Process Response
Apply Set
Replace [x]
OK

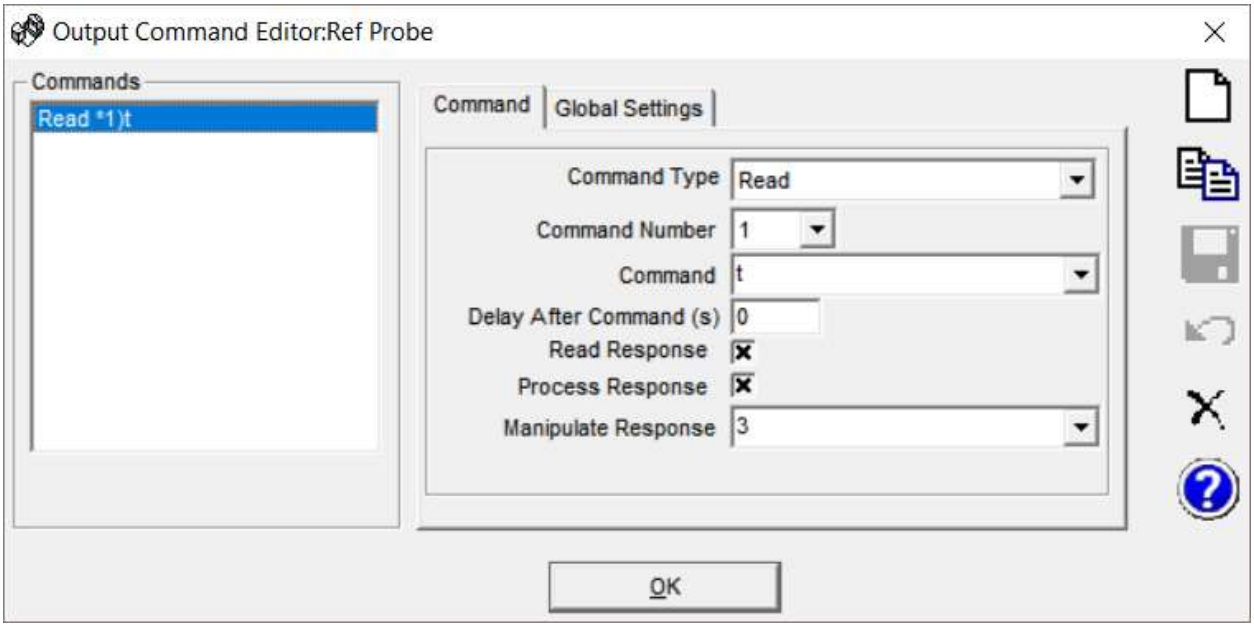

Support Device Editor
Record Label
Hart 7320
2 / 8
Header
Calibration
Communications
Output
Set
Comment
Device Comment
Purpose of this is for temperature control. Uses custom measurement unit Degrees F".
Baud rate limited to 2400. <CR> only for command terminator.
No Output is required because this is control only. The bath uses an internal sensor for feedback contrl
Setup Info
Close

Define the 1504 Monitor:

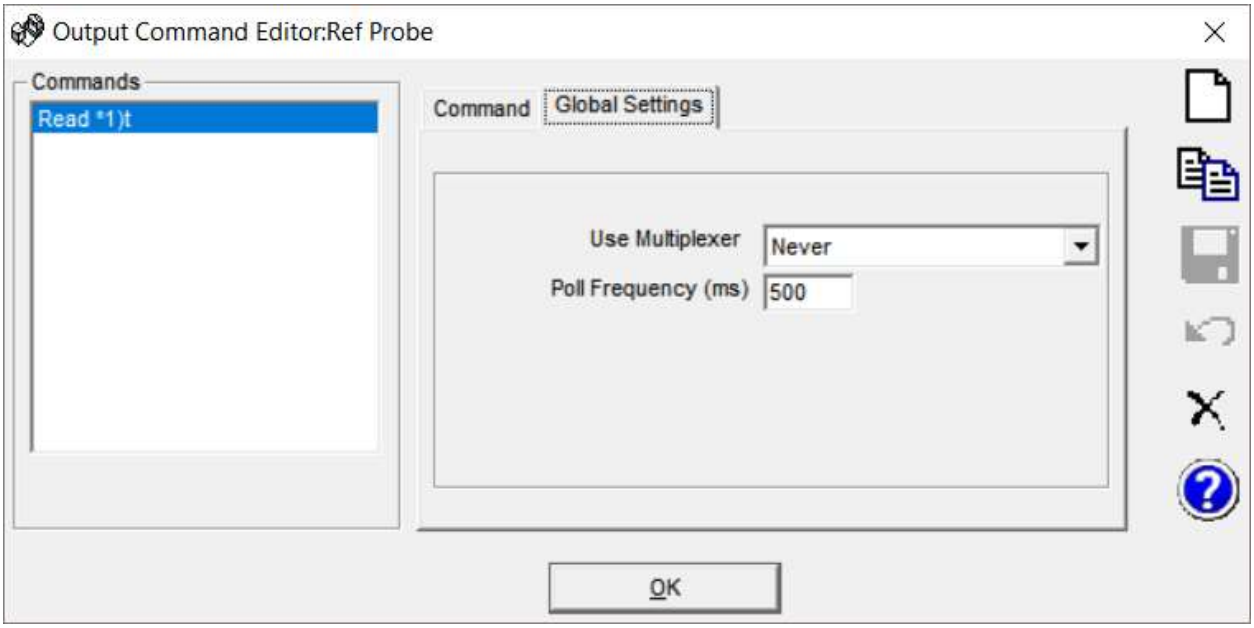


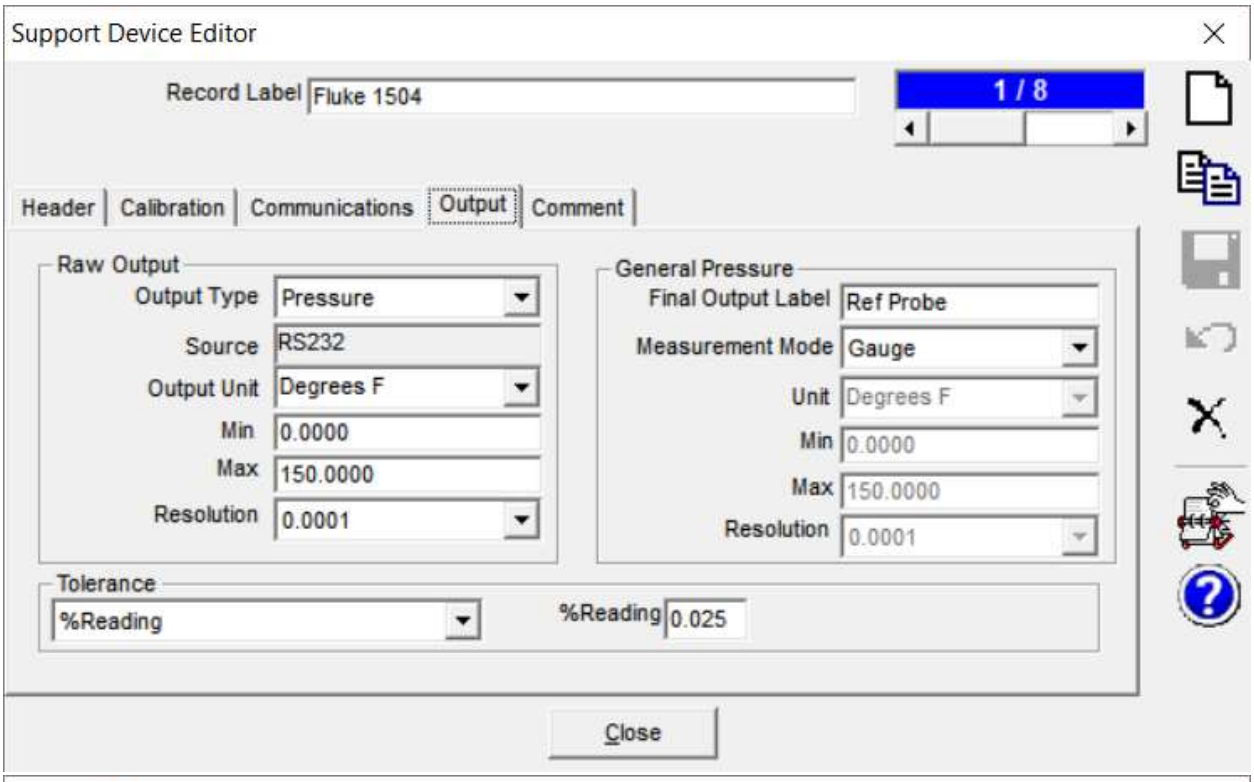


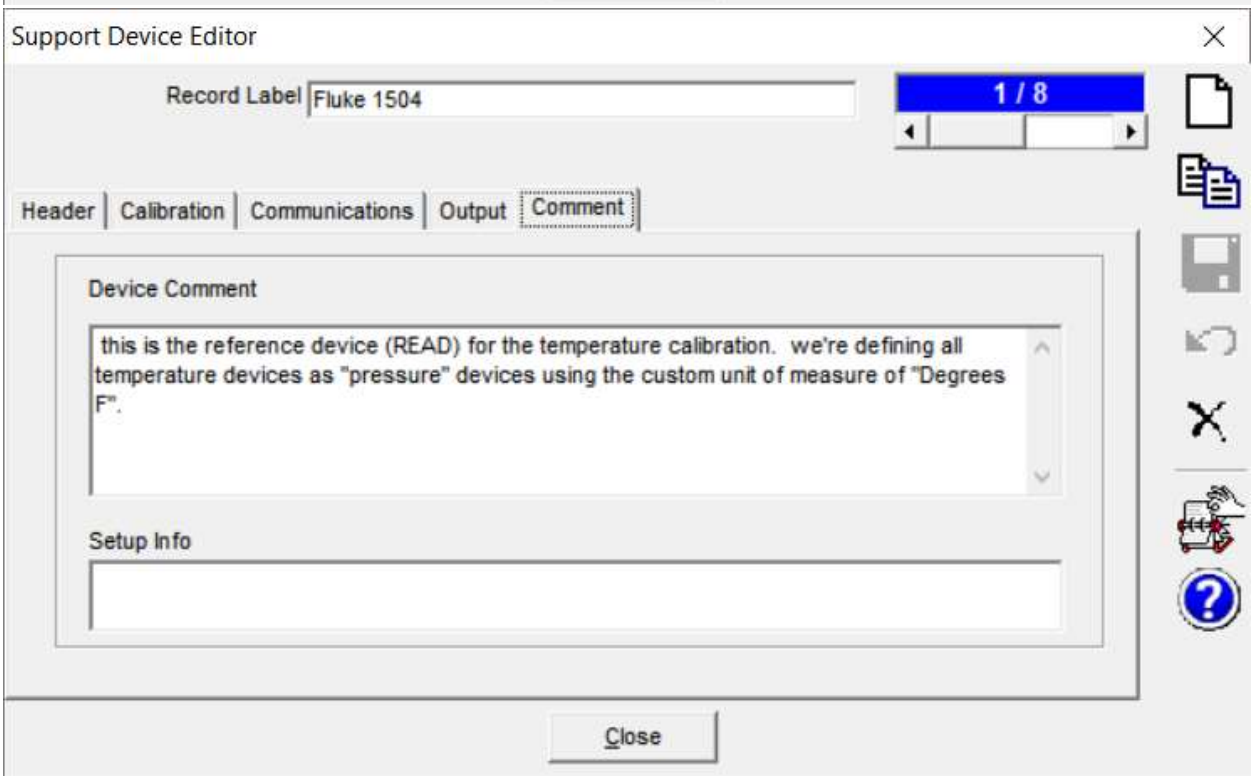
Strip three leading characters from the return string.



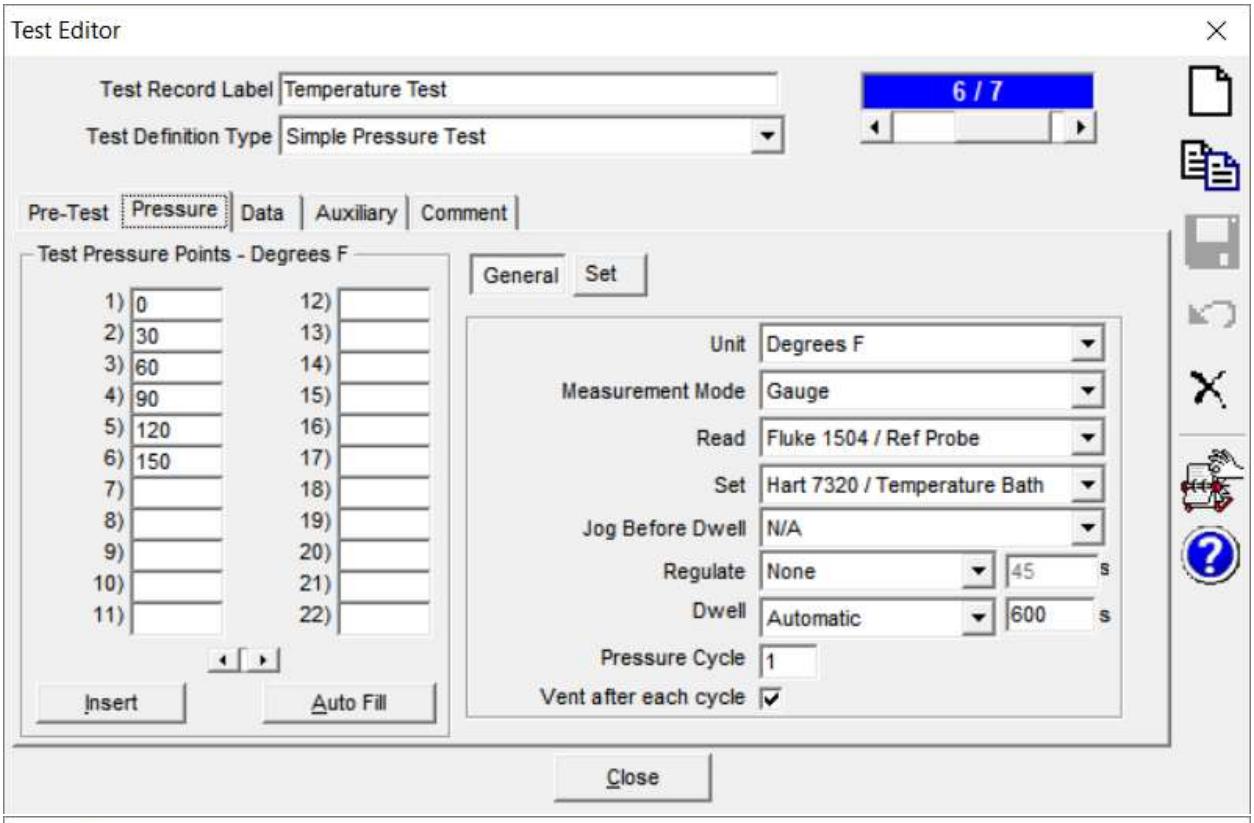
The 1504 return strings become truncated/partially dropped when rapidly queried. Therefore, use a poll frequency delay of 500 ms.

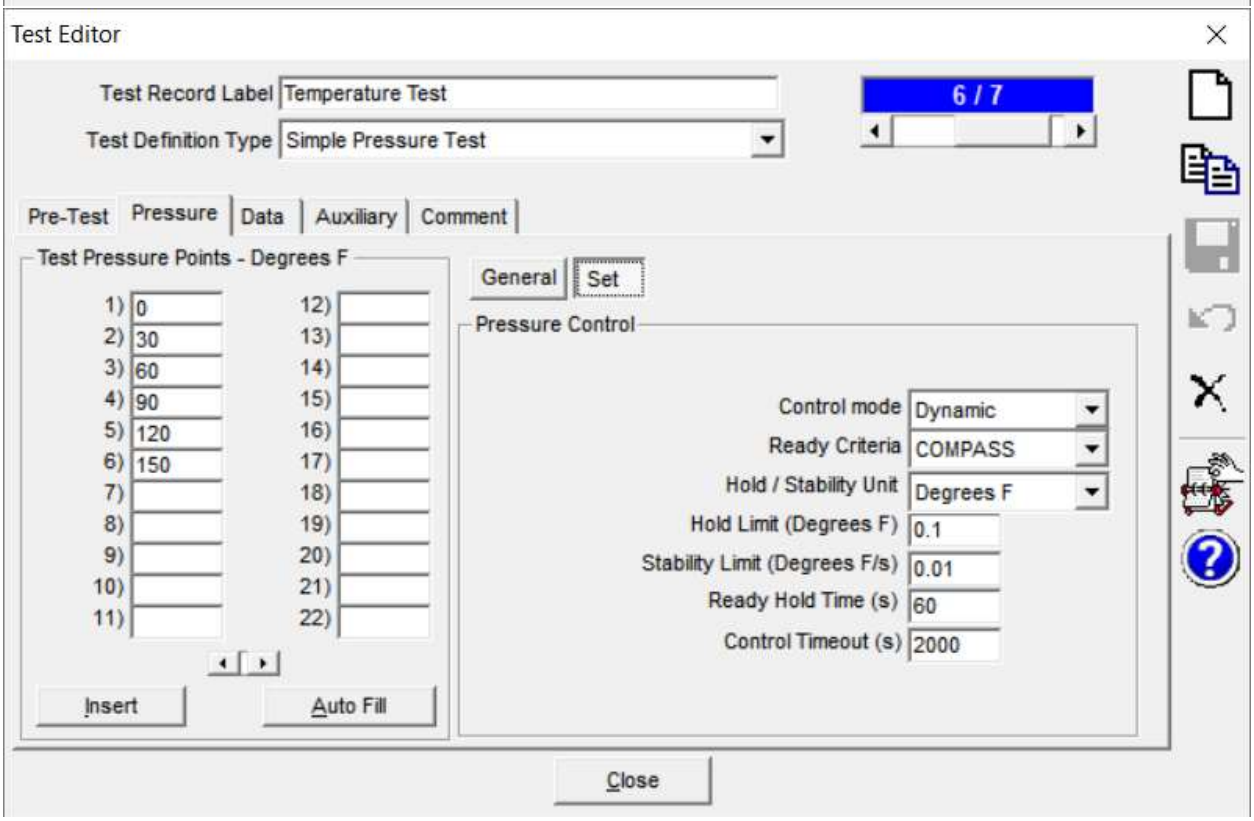



Support Device Editor
Record Label
Fluke 1504
1 / 8
Header
Calibration
Communications
Output
Comment
Raw Output
Output Type
Pressure
Source
RS232
Output Unit
Degrees F
Min
0.0000
Max
150.0000
Resolution
0.0001
General Pressure
Final Output Label
Ref Probe
Measurement Mode
Gauge
Unit
Degrees F
Min
0.0000
Max
150.0000
Resolution
0.0001
Tolerance
%Reading
%Reading
0.025
Close

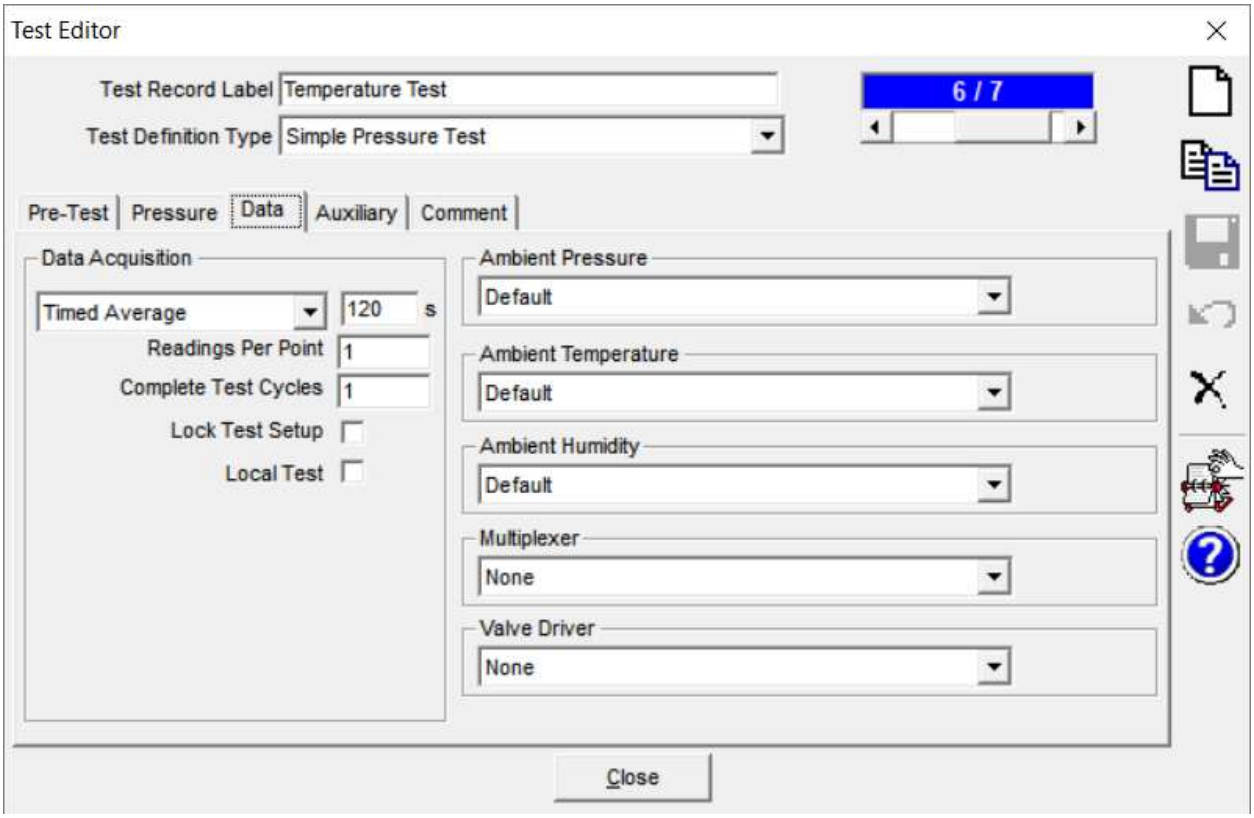

Support Device Editor
Record Label
Fluke 1504
1 / 8
Header
Calibration
Communications
Output
Comment
Device Comment
this is the reference device (READ) for the temperature calibration. we're defining all temperature devices as "pressure" devices using the custom unit of measure of "Degrees F".
Setup Info
Close

Define the Test Definition. There are no pretest operations.



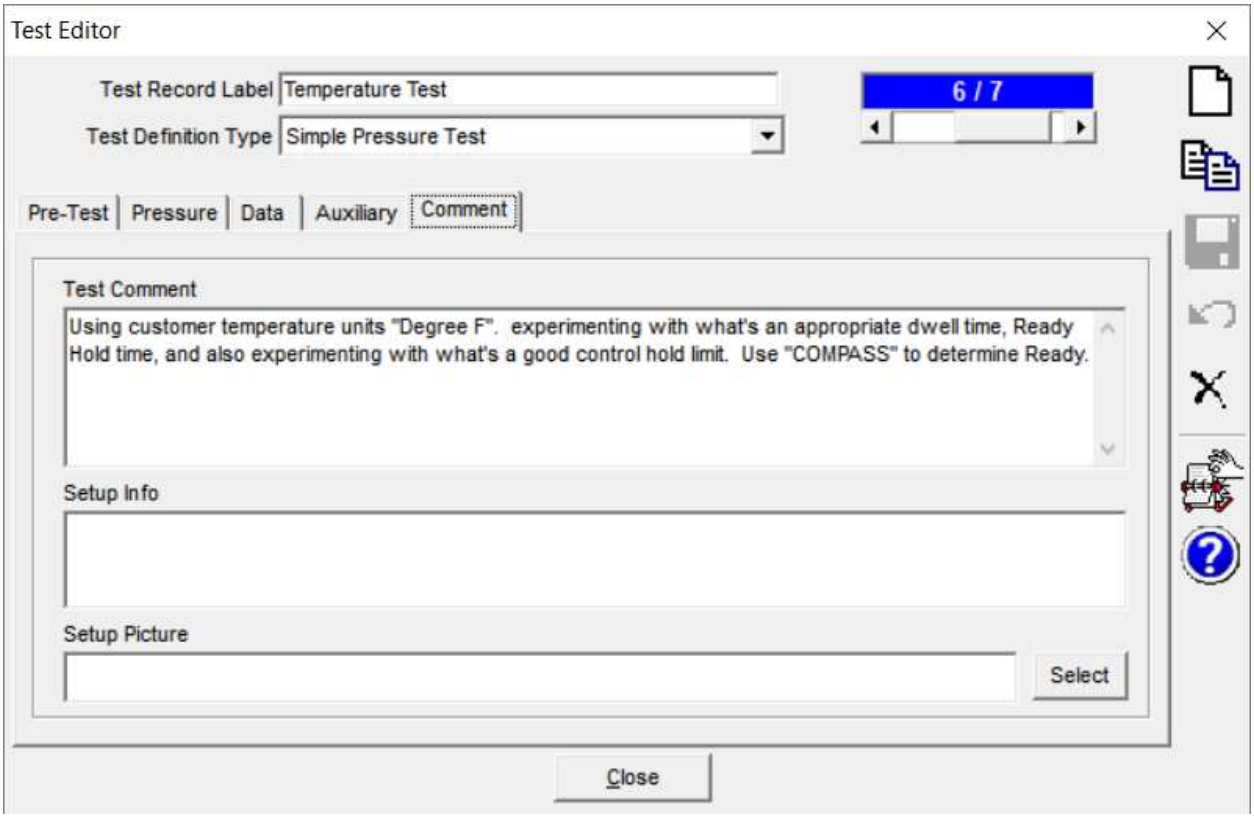


2000s = 40 min. This is sufficient time for making a 30°F change. Observed rates of approximately 5°/6 minutes. The use Ready Criteria of “COMPASS” worked well for the 7320 bath.



120s dwell time might be too short due the small temperature oscillations from the bath which seem to be about 90s / period.

No Auxiliary Device selections.


Test Editor
Test Record Label
Temperature Test
Test Definition Type
Simple Pressure Test
6 / 7
Pre-Test
Pressure
Data
Auxiliary
Comment
Test Comment
Using customer temperature units "Degree F". experimenting with what's an appropriate dwell time, Ready Hold time, and also experimenting with what's a good control hold limit. Use "COMPASS" to determine Ready.
Setup Info
Setup Picture
Select
Close