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## 9200 Programming

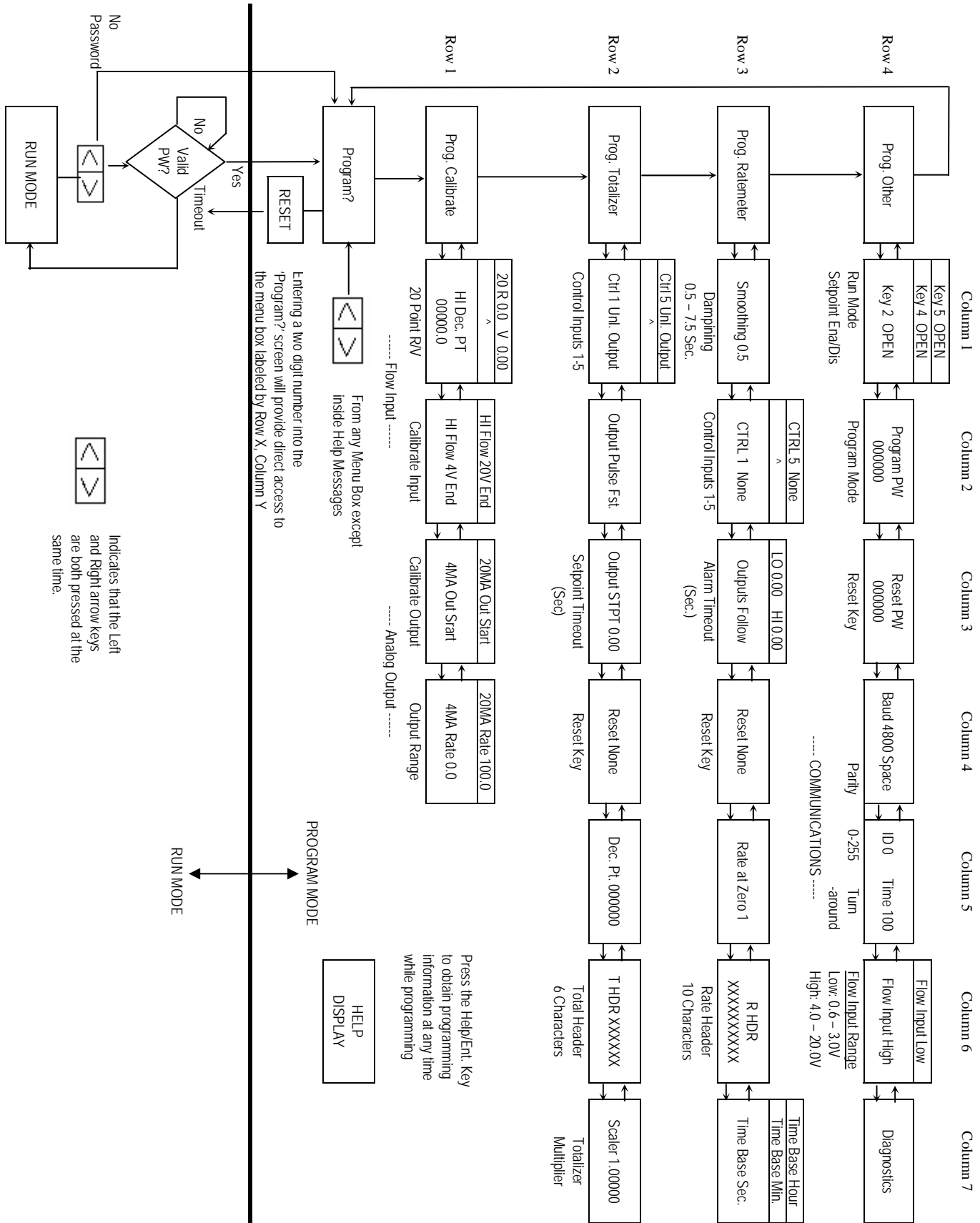
The 9200 remote electronics is a programmable linearizer for the flow element which outputs a non-linear DC Voltage. The 9200 is programmed with the non-linear data curve by means of the best 20 data points picked throughout the data "curve" for a point-to-point linearization. A computer program picks these 20 data points and programs the 9200 along with the rest of the settings needed for the outputs.

There are two modes of the 9200. RUN Mode which is during normal operation and PROGRAM Mode which is where you do the programming. To get to the PROGRAM Mode, you need to press the LEFT and RIGHT Arrow keys together at the same time. The display will read "PROGRAM ?". If there was a password assigned then you will be asked for it before you can get to the PROGRAM start. When you want to return to RUN Mode then just press the LEFT and RIGHT Arrow keys together at the same time regardless of where in the program you're at and you'll be returned to the start "PROGRAM ?". From there just press the Reset key and the 9200 will return to the RUN Mode.

On the next page you'll see the program matrix consisting of 4 rows and 7 columns. To follow through the matrix with the KEYPAD just press the corresponding arrow keys UP, LEFT, or RIGHT.

While we don't recommend the need to explore the PROGRAM Mode due to accidental programming change, there are some spots in the programming you may want to change due to changes in production but yet there are other spots in the program you should not change at all or cause the 9200 to fail in operation. All the values and calibration needed are done at the Factory.

The following pages will go through each of the programming spots and describe the uses and modifying procedure.



Indicates that the Left and Right arrow keys are both pressed at the same time.

Press the Help/Ent. Key to obtain programming information at any time while programming

**Row 1, Column 1**

PROG. CALIBRATE

HI DEC. PT. XXXXXX

(HI Range Decimal Point). The HI Range is always used. See Row 4, Column 6 for explanation.

This just moves the location of the decimal point of the flowrate data and does not adjust the data.

Press the KEYPAD number 0 to 4 for decimal location selection.

This is also the location where the 20 data points are stored.

Press the UP Arrow key to scroll through the data points.

What is displayed is:

X	R XXXXXX	V XX.XX
(Data line number)	(Flowrate value)	(DC Voltage value)

As you scroll through the data points you may encounter the last couple of lines as all zeros. This is because the computer determined the curve could be done just fine without using all 20 data spots.

To change the values of any line:

Press the RIGHT Arrow key.

The R will be flashing.

Press the CLR key.

Enter in the value by using the KEYPAD.

Press the ENT key. Now the flowrate value is stored.

Press the RIGHT Arrow key.

The V will be flashing.

Press the CLR key.

Enter in the value by using the KEYPAD.

Press the ENT key. Now the DC Voltage value is stored.

Note: To enter a blank data line just enter in zero for both the flowrate and voltage.

Press the UP Arrow key to get to the next data line.

## **Row 1, Column 2**

PROG. CALIBRATE

HI FLOW 4V END? and HI FLOW 20V END?

The 9200 has a built-in V/F (Voltage to Frequency) input board. So since the 9200 only “sees” frequency, it initially does not know what DC Voltage you are inputting. The 9200 frequency therefore needs to be calibrated against known voltages.

The input connections may vary from meter to meter but the connection is always where the Black (-) and Green (+) wires from the flow element are placed. The terminal may be labeled “3” (-) and “4” (+) or just “-” and “+”. Just make a note where the Black and Green wires are terminated before removing.

HI FLOW 4V END?

This is to calibrate the 9200 for 4 VDC input.

Place 4.00 VDC on the input.  
Press the Reset key to set the 4 V point.

Press the UP Arrow key.

HI FLOW 20V END?

This is to calibrate the 9200 for 20 VDC input.

Place 20.00 VDC on the input.  
Press the Reset key to set the 20 V point.

With the 4 V and the 20 V set, the 9200 is now calibrated from 4 to 20 VDC due to linear frequency.

### **Row 1, Column 3**

PROG. CALIBRATE

4MA OUT START? and 20MA OUT START?

The 4 mA and 20 mA output “clamping” calibration initially needs to be set. This calibration is to set the zero flow 4 mA output and set the full scale flow 20 mA output.

4MA OUT START?

This is to set the 4 mA output.

Connect a mA meter to the mA output connections. The mA output is not powered, so you will need to go through the 24 VDC supply at the 9200 or through a 24 VDC supply of your own.

Press the CLR key.

Press either the LEFT or RIGHT Arrow keys to decrease or increase the output value.

Press the ENT key to set.

Push the UP Arrow key.

20MA OUT START?

This is to set the 20 mA output.

Use the same mA connections as the 4 mA output calibration.

Press the CLR key.

Press either the LEFT or RIGHT Arrow keys to decrease or increase the output value.

Press the ENT key to set.

**Row 1, Column 4**

PROG. CALIBRATE

4 MA RATE XXXXXX and 20 MA RATE XXXXXX

4 MA RATE XXXXXX

This is to set the 4 mA to the lowest flowrate value. This is usually set to 0.

Press the CLR key.

Enter in the value by using the KEYPAD.

Press the ENT key.

Press the UP Arrow key.

20 MA RATE XXXXXX

This is to set the 20 mA to the full scale flowrate value.

Press the CLR key.

Enter in the value by using the KEYPAD.

Press the ENT key.

Note: This value cannot be higher than the highest programmed data point. If it is set higher, the outputs will just stop at the highest data point and never reach the entered full scale.

**Row 2, Column 1**

PROG. TOTALIZER

CTRL X \_\_\_\_\_

(Control Inputs 1 to 5)

The 9200 has 5 programmable input triggers which can be shared to do flowrate and totalizer actions (See Row 3, Column 2 to see the programmable ratemeter functions for these triggers). These triggers are activated by shorting out the trigger input to ground.

Press 1 to 5 keys on the KEYPAD to select which 1 to 5 trigger input to program.

Press the UP Arrow key to select the programming options below:

- RST. COUNT (Reset count)  
Resets the totalizer count only. Will not unlatch the totalizer relay.
- UNL. OUTPUT (Unlatch output)  
Unlatches the relay only. Will not reset the totalizer count.
- RST + UNL (Reset and Unlatch)  
Resets the totalizer count and unlatches the relay.
- NONE  
Nothing will be done for any of the totalizer functions.

**Row 2, Column 2**

OUTPUT PULSE \_\_\_\_\_

This is to set the totalizer pulse width output.

Press the UP Arrow key to select the programming options below:

- FST (Fast)  
Pulse width of 125  $\mu$ S ON and 125  $\mu$ S OFF. Max Frequency is 1500 Hz.
- MED (Medium)  
Pulse width of 2 mS ON and 2 mS OFF. Max Frequency is 200 Hz.
- SLO (Slow)  
Pulse width of 50 mS ON and 50 mS OFF. Max Frequency is 10 Hz.
- NO PULSE  
No pulse output.

**Row 2, Column 3**

PROG. TOTALIZER  
OUTPUT STPT. X.XX  
(Output Setpoint)

This is a timer for the totalizer relay latch. Set this timer for how long you need the totalizer relay latched. The number value is in seconds which can be set from 0.00 to 99.99 seconds. A setting of 0.00 will disable the timer and will not unlatch unless by other means.

Press the CLR key.  
Enter in the value by using the KEYPAD.  
Press the ENT key.

**Row 2, Column 4**

PROG. TOTALIZER  
RESET \_\_\_\_\_

This is to program the KEYPAD Reset key for totalizer functions. The following selections are for the action done for totalizer function when the reset key is pressed.

Note: The Reset key can be shared between totalizer functions and ratemeter functions. See Row 3, Column 4 for ratemeter functions for the Reset key.

Press the UP Arrow key for the following programming selections:

- RST. COUNT (Reset Count)

Pressing the Reset key will only reset the totalizer count to zero and will not unlatch the totalizer relay.

- UNL. OUTPUT (Unlatch Output)

Pressing the Reset key will only unlatch the totalizer relay and will not reset the totalizer count to zero.

- RST. + UNL. (Reset and Unlatch)

Pressing the Reset key will reset the totalizer count to zero and unlatch the totalizer relay.

- NONE

Pressing the Reset key will do nothing for any totalizer functions.

**Row 2, Column 5**

PROG. TOTALIZER  
DEC. PT. XXXXXX  
(Decimal Point)

This is to set the totalizer decimal point. This just moves the decimal point and will not adjust the count rate.

Press the UP Arrow key to select from 0 to the 5<sup>th</sup> decimal place.

**Row 2, Column 6**

PROG. TOTALIZER  
T HDR XXXXXX  
(Totalizer Header)

This is to label the totalizer 6 character header. Selections are from A to Z, /, and blank.

Use the LEFT and RIGHT Arrow keys to select the location.

Use the UP Arrow key to select the character.

**Row 2, Column 7**

PROG. TOTALIZER  
SCALER XXXXXX

This is to set the totalizer scaler (or also known as either the K factor or Multiplier).

This number is used to scale the totalizer output count by multiplying the number to the real totalizer count.

Example: SCALER .01 and the flowrate is 1000 PPH (Pounds Per Hour). The totalizer output count will be  $1000 \text{ PPH} \times .01 = 10$  counts per hour output.

Press the CLR key.

Enter in the value by using the KEYPAD. The decimal point is on the LEFT Arrow key which also has the initials DP on it.

Press the ENT key.

**Row 3, Column 1**

PROG. RATEMETER  
SMOOTHING X.X

This is to smooth out (or dampen) the outputs. The numbers can be from .5 to 7.5 seconds. This is basically the number of seconds between readings to match current reading therefore the higher the number the longer the meter will take to adjust to the new flowrate reading. This is useful with noisy flowrates to help dampen the output from being noisy itself.

Push the UP Arrow key. The number advances by every .5 seconds.

**Row 3, Column 2**

PROG. RATEMETER  
CTRL X \_\_\_\_\_  
(Control Inputs 1 to 5)

The 9200 has 5 programmable input triggers which can be shared to do flowrate and totalizer actions (See Row 2, Column 1 to see the programmable totalizer functions for these triggers). These triggers are activated by shorting out the trigger input to ground.

Press 1 to 5 keys on the KEYPAD to select which 1 to 5 trigger input to program.

Press the UP Arrow key to select the programming options below:

- UNL. OUTPUT (Unlatch output)

Unlatches both HI and LO relays.

Note: Relays will re-latch if flowrate is passed the setpoints of either LO or HI. This setting is good for when you have the relay latch release timeout set and you want to unlatch before time is up. See Row 3, Column 3 for information on relay latch timeout.

- NONE

Nothing will be done for the ratemeter function.

### **Row 3, Column 3**

PROG. RATEMETER

OUTPUTS FOLLOW or LO X.XX HI X.XX

This is for the LO and HI relay latch timer.

Press the UP Arrow key to select which two of the following:

#### **- OUTPUTS FOLLOW**

The LO and HI Relays will normally latch and unlatch depending on the setpoints with no delays.

#### **- LO X.XX HI X.XX**

This is to set the timer to delay the unlatching of the HI or LO relays once the flowrate is in the unlatch area behind the setpoint.

In the LO X.XX HI X.XX selection, press the LEFT or RIGHT Arrow keys to select either the LO or HI. The selected one will flash.

Press the CLR key.

Enter in the value by using the KEYPAD.

Press the ENT key.

### **Row 3, Column 4**

PROG. RATEMETER

RESET \_\_\_\_\_

This is to program the KEYPAD Reset key for ratemeter functions. The following selections are for the action done for ratemeter function when the reset key is pressed.

Note: The Reset key can be shared between totalizer functions and ratemeter functions. See Row 2, Column 4 for totalizer functions for the Reset key.

Press the UP Arrow key for the following programming selections:

#### **- UNL. HI/LO**

Pressing the Reset key will unlatch both HI and LO relays.

Note: Relays will re-latch if flowrate is passed the setpoints of either LO or HI. This setting is good for when you have the relay latch release timeout set and you want to unlatch before time is up. See Row 3, Column 3 for information on relay latch timeout.

#### **- NONE**

Pressing the Reset key will do nothing for the ratemeter function.

**Row 3, Column 5**

PROG. RATEMETER  
RATE AT ZERO XX

This is to set the delay the meter, in seconds, to zero flow indication once no flow is achieved. Display will hold the last sampled flowrate until the timer is done which then the indication will go to zero.

Press the CLR key.

Enter in the value by using the KEYPAD. Valid entries are from 1 to 15 seconds.

Press the ENT key.

**Row 3, Column 6**

PROG. RATEMETER  
R HDR. XXXXXXXXXXXX  
(Rate Header)

This is to label the ratemeter 10 character header. Selections are from A to Z, /, and blank.

Use the LEFT and RIGHT Arrow keys to select the location.

Use the UP Arrow key to select the character.

**Row 3, Column 7**

PROG. RATEMETER  
TIME BASE \_\_\_\_\_

This is to set the timeframe calculation for the totalizer count in reference to the flowrate indication.

Press the UP Arrow key for the following selections:

- SEC (Seconds)

This will cause the totalizer to count the value of the flowrate indication per second.

- MIN (Minutes)

This will cause the totalizer to count the value of the flowrate indication per minutes.

- HOUR

This will cause the totalizer to count the value of the flowrate indication per hour.



**Row 4, Column 1**

PROG. OTHER

KEY X \_\_\_\_\_

(Key 2,4, and 5)

This is to lock or unlock the ability to change the Total Setpoint (Key 2), LO Rate setpoint (Key 4), or HI Rate setpoint (Key 5) values at the KEYPAD during RUN Mode.

Press the 2, 4, or 5 key to select either the Total Setpoint (Key 2), LO Rate setpoint (Key 4), or HI Rate setpoint (Key 5).

Press the UP Arrow key to select either LOCKED or OPEN (unlocked).

**Row 4, Column 2**

PROG. OTHER

PROG. PW XXXXXX

(Program Password)

This is to set the 6 digit password for Program Mode entry.

Press the CLR key.

Enter the 6 digit password by using the KEYPAD. A 000000 entry is for no password. Factory set for no password.

Press the ENT key.

Note: Remember the password or else you will need to return the 9200 to the factory for password clearing to access the Program Mode.

**Row 4, Column 3**

PROG. OTHER

RESET PW XXXXXX

(Reset Password)

This is to set the 6 digit password for the Reset key.

Press the CLR key.

Enter the 6 digit password by using the KEYPAD. A 000000 entry is for no password. Factory set for no password.

Press the ENT key.

Once the reset password is set, then when the Reset key is pressed during RUN Mode, it will ask for the password before proceeding.

**Row 4, Column 4**

PROG. OTHER

BAUD XXXX \_\_\_\_\_

This is to set the Baud Rate and Parity for programming the 9200 by the RS485 connection. Factory used only.

We currently do not offer software to program the 9200.

**Row 4, Column 5**

PROG. OTHER

ID X TIME XXX

This is to set the 9200 identifier and turnaround for networking communications.

We currently do not offer software to program the 9200.

**Row 4, Column 6**

PROG. OTHER

FLOW INPUT \_\_\_\_\_

This is to set the input voltage range to the 9200.

Press the UP Arrow key to select the following:

- LOW

.6 to 3.0 VDC Input.

- HIGH

4.0 to 20.0 VDC Input.

Note: The 9200 should **always** be set for HIGH input due to all our meters' EXC (or Transducer) voltage is above 4.0 VDC.

**Row 4, Column 7**  
PROG. OTHER  
DIAGNOSTICS

This is to perform the 9200 internal diagnostics, which is done in steps.

Press the UP Arrow key.  
The display should have all 8's with decimal points.

Press the UP Arrow key.  
The display should have all \*'s.

Press the UP Arrow key.  
The display should read TEST IN PROGRESS. Wait for a few seconds, then the display should read SYSTEM TEST OK, then back to DIAGNOSTICS.