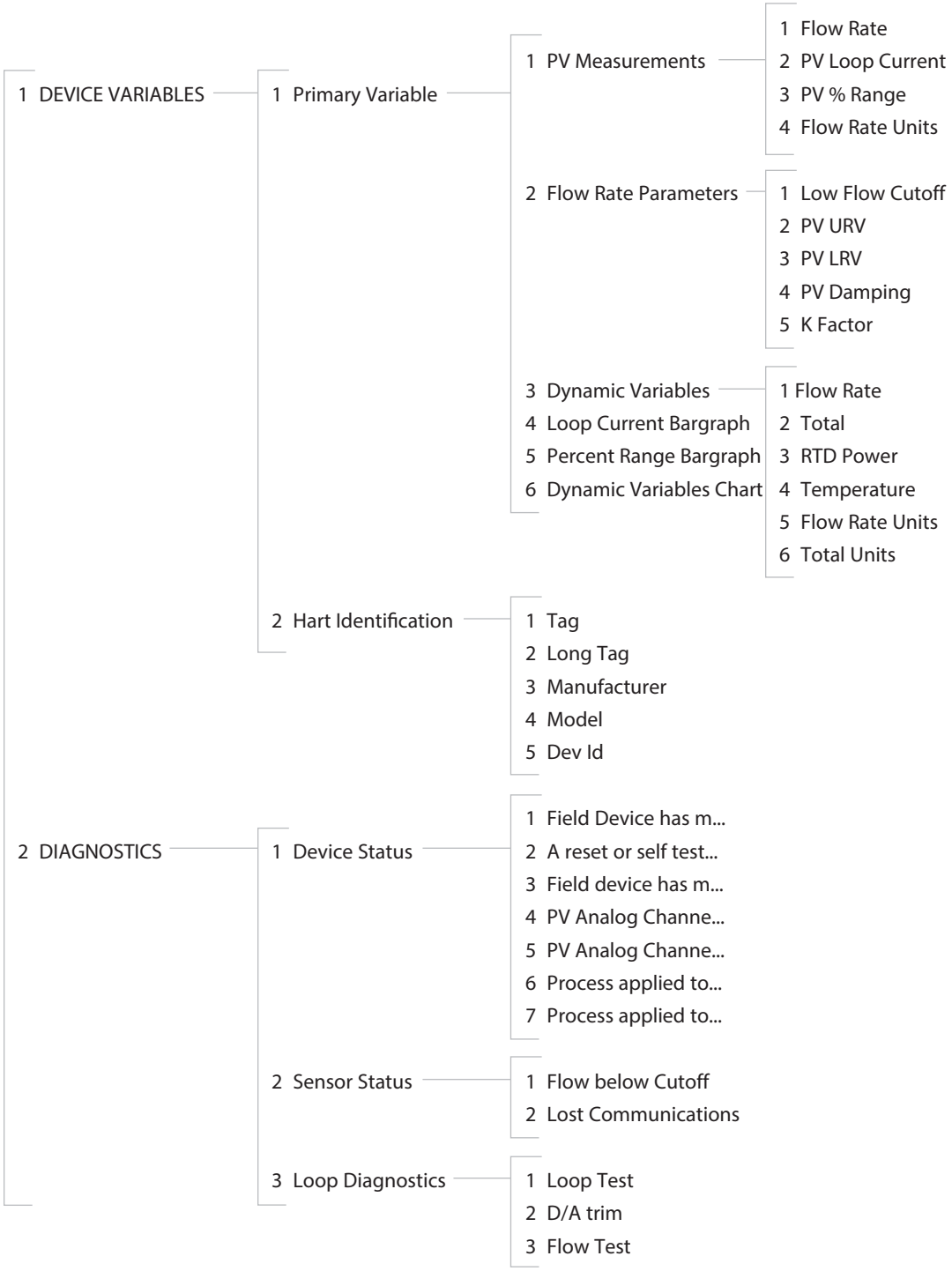
Section G

HART

HART Menu Tree



DEFAULT:
PV = Flow
SV = Temperature
TV = Total


3 DEVICE SETUP
1 Basic Setup
1 K Factor
2 PV Damping
3 Low Flow Cutoff
4 Flow Rate Units
5 Temperature Units
6 Total Units
2 Output
1 Analog Output
1 PV URV
2 Totalizer
1 Total Units
2 Total
3 Pulse Output
1 Pulse Count
2 Pulse Duration
4 HART
1 Poll addr
2 Loop current mode
3 Num req preams
3 Device Info
1 Tag
2 Long tag
3 Descriptor
4 Message
5 Date
6 Meter S/N
7 Final asmbly num
8 Revision
1 Universal rev
2 Fld dev rev
3 Software rev
4 Hardware rev
4 Factory
1 Flow Factors
1 Flow Coeff A
2 Flow Coeff B
3 Flow Coeff C
4 Flow Coeff D
5 Flow Coeff F
2 TC Factors
1 Temp Coeff A
2 Temp Coeff B
3 Temp Coeff C

HART

Following reviews the various parameters used in the HART menu structure and provides fast keys for accessing this information:

PRIMARY VARIABLE - READ ONLY
Provides information regarding the Primary Variable (Flow)

PV MEASUREMENTS
FLOW RATE [Fast Key 1,1,1,1]
Actual measurement of the flow rate in the reference unit of measurement

PV LOOP CUrrENT [Fast Key 1,1,1,2]
Analog value output ranging between 4 and 20 mA representing the flow rate. The 4 and 20 mA loop can be verified by using the Loop Test described below in the Diagnostic section [Fast Key 2,3,1].

PV % OF RANGE [Fast Key 1,1,1,3]
Provides the value of the flow rate representing the % of range between the LRV (Lower Range Value) and the URV (Upper Range Value).

FLOW RATE UNITS [Fast Key 1,1,1,4]
Units of measurement associated with the flow rate.

FLOW RATE PARAMETERS
LOW FLOW CUTOFF [Fast Key 1,1,2,1]
Any measured flow rate below this value will be set to 0.

PV URV [Fast Key 1,1,2,2]
Upper Range Value of the Primary Variable. Represents the 20 mA value

PV LRV [Fast Key 1,1,2,3]
Lower Range Value of the Primary Variable. Represents the 4 mA value. Value is 0.

PV DAMPING [Fast Key 1,1,2,4]
Primary Variable Damping factor. Used to smooth out normal occurring fluctuations in the flow rate. Values range between .001 and .999 which represents no smoothing. Lower values increase damping.

K FACTOR [Fast Key 1,1,2,5]
K Factor is a linear adjustment factor which may be used to adjust the flow rate for various reasons requested by the user. Default is 1.

DYNAMIC VARIABLES
FLOW RATE [Fast Key 1,1,3,1]
Displays the current flow rate measured by the flow meter.

TOTAL [Fast Key 1,1,3,2]
Displays the total flow measured by the instrument.

RTD POWER [Fast Key 1,1,3,3]
Measurement of the power in mW corresponding to the measured flow rate. Useful for diagnostic purposes

TEMPERATURE [Fast Key 1,1,3,4]
Displays the gas temperature where the sensor is located

FLOW RATE UNITS [Fast Key 1,1,3,5]
Units of measurement of the flow rate

TOTAL UNITS [Fast Key 1,1,3,6]
Units of measurement of the total flow

LOOP CURRENT BARGRAPH [Fast Key 1,1,4]
Displays a graphic chart showing the mA output of the flow rate vs. time – Range between 4 and 20 mA

PERCENT RANGE BARGRAPH [Fast Key 1,1,5]
Displays a graphic chart showing the flow rate as a % of range between the LRV and URV

DYNAMIC VARIABLES CHART [Fast Key 1,1,6]
Displays a graphic chart showing flow rate in selected units of measurement vs. time

HART IDENTIFICATION

TAG [Fast Key 1,2,1]
A Tag value entered by the user to identify the flow meter. Up to 8 digits in length

LONG TAG [Fast Key 1,2,2]
A value entered by the user

MANUFACTURER [Fast Key 1,2,3]
The name of the Manufacturer of the flow meter. In this case it is Sage Metering

MODEL [Fast Key 1,2,4]
Manufacturer's model number of the flow meter.

DEVICE ID [Fast Key 1,2,5]
Factory entered number which is unique for each instrument

DIAGNOSTICS
DEVICE STATUS [Fast Key 2,1]
Will indicate any standard diagnostics message

SENSOR STATUS

FLOW BELOW CUTOFF [Fast Key 2,2,1]
Diagnostics menu indicating that the measured flow rate is less than the low flow cutoff

LOOP DIAGNOSTICS

LOOP TEST [Fast Key 2,3,1]
Permits the user to drive the mA output to a desired value.

D/A TRIM [Fast Key 2,3,2]
Used to calibrate the 4-20 mA output from the flow meter to match the system loop.

F**LOW TEST** [Fast Key 2,3,3]
Permits user to enter a value for the RTD Power with the display showing expected flow rate based on original calibration. Useful diagnostics test to insure that the flow meter is matching the original calibration curve.

DEVICE SETUP

BASIC SETUP
K FACTOR [Fast Key 3,1,1]
Enter a K factor which will provide a linear adjustment of the flow rate. May be used to correct for different pipe size, varying gas composition, or installation effects which change the performance of the flow meter.

PV DAMPING [Fast Key 3,1,2]
Provides smoothing of normally occurring flow fluctuations. Value between 0.001 to 0.999; the lower the value providing greater smoothing (time averaging).

LOW FLOW CUTOFF [Fast Key 3,1,3]
Enter a minimum value of the flow rate. Flow rates measured below this value will be shown as zero flow. Useful to disregard any false readings which might occur during a no flow condition

FLOW RATE UNITS [Fast Key 3,1,4]
Units of measurement of the flow rate. This is a text entry. Any change in units of measurement from original calibration must also apply a K factor

TEMPERATURE UNITS [Fast Key 3,1,5]
Displays the units of measurement of the gas temperature

TOTAL UNITS [Fast Key 3,1,6]
Four digit entry. The first three digits will represent the units of measurements of total flow and the fourth digit will be "C" or "F" to identify units of measurement of the temperature reading.

OUTPUT

ANALOG OUTPUT
PV URV [Fast Key 3,2,1,1]
Enter the Upper Range Value for the Primary Variable (flow rate). The URV must be in the identified units of measurement and must be within the calibration range of the instrument. Consult Sage Metering if assistance is requied.

TOTALIZER

TOTAL UNITS [Fast Key 3,2,2,1]
Displays the units of measurement for the totalized value.

TOTAL [Fast Key 3,2,2,2]
Displays the totalized value in the selected units of measurement.

PULSE OUTPUT

PULSE COUNT [Fast key 3,2,3,1]
Provides the number of units per pulse. Example will be a Pulse Count of 100 and units are set to SCF, then one pulse is equivalent to 100 SCF.

Pulse Duration [Fast Key 3,2,3,2]

HART

POLL ADDRESS [Fast Key 3,2,4,1]
Used multi drop installations to identify an individual instrument. Values can range between 1 and 15. If used in a multi drop configuration the 4-20 mA output will be set to 4 mA. The default setting is a Poll Address = 0 with the 4-20 mA analog signal operational.

LOOP CURRENT MODE [Fast Key 3,2,4,2]
Allows the user to select whether the loop current is enabled (active) or disabled (fixed at 4mA) regardless of the poll address setting.

Number of Request Preambles [Fast Key 3,2,4,3]
Required HART command – indicates the number of preambles required by the instrument for HART communication.

DEVICE INFORMATION

TAG [Fast Key 3,3,1]
Enter a 8 digit tag which can be used to identify the instrument

LONG TAG [Fast Key 3,3,2]
Enter up to a 32 digit tag which can be used for any purpose desired by the user.

DESCRIPTOR [Fast Key 3,3,3]
A 16 character entry which can be used for additional identification of the instrument.

MESSAGE [Fast Key 3,3,4]
A 32 character entry which can be used for identification or other purposes.

DATE [Fast Key 3,3,5]
Enter date code; often used to enter last date a configuration change had been made.

METER S/N [Fast Key 3,3,6]
Factory entry of the serial number of the instrument

FINAL ASSEMBLY NUM [Fast Key 3,3,7]
User entered identification which may be used for future reference

REVISIONS:

- Universal Revision Number [Fast key 3,3,8,1]
  Identifies the HART specification used in the design of the instrument.
- Field Device Revision Number [Fast Key 3,3,8,2]
  Provides the instrument revision for HART compatibility
- Software Revision Level [Fast Key 3,3,8,3]
  Provides the software revision used by the instrument
- Hardware Revision Level [Fast Key 3,3,8,4]
  Provides the Hardware revision level of the instrument

FACTORY

Flow Factors and TC Factors
Displays factory entered calibration values for the instrument