

Manual



FlowPod

Local Display with HART and Exd Certification

Manual-Version FlowPod_M_EN_170515_E003

SW-Version

This document is valid for Main SW: 1.6 and higher

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1. General Information

1.1. Purpose

The purpose of this document is to provide guidance to the user on the FlowPod PC Utility usage. This revision of the document corresponds to the software version 1.6 and higher.

1.2. Safety

1.2.1. General Safety

All statements regarding safety of operation and technical data in this manual will only apply when the FlowPod is operated correctly in accordance with this manual.

The data for Ingress Protection (IPnn) will only apply when all connectors are caped properly with the corresponding counterpart with the same or better IP rating. Cable glands must be populated with cables with the specified diameter and closed properly. The display cover must be closed.

During operation all openings of the housing must be closed unless otherwise is noted in this manual.

All electrical connections to the load and to the supply must be made with shielded cables unless otherwise is noted in this manual. The FlowPod must be grounded.

As a protection against fire in the positive supply, a fuse with a current rating not higher than the current carrying capacity of the cable used is required.

The user has to adhere to the instructions for installing electrical devices and corresponding instructions.

The devices described in this manual may only be connected and operated by authorized and qualified personnel.

1.2.2. Warnings in this manual

NOTE:

Notes provide important information for the correct usage of the equipment. If the notes are not observed, a malfunction of the equipment is possible.

WARNING!

Warnings provide very important information for the correct usage of the equipment. Not observing the warnings may lead to danger for the equipment and to danger for health and life of the user

2. Usage

2.1. Communication Settings

- Select the COM Port that corresponds to the COM Port of the interface communication with the target device from the drop down box.
- Select poll address. Default is 0, unless it has been set to a different value using HART command 6.
- Currently only Baud Rate of 1200 is supported.
- Select the number of preambles that is sent from this utility to the target device. 5 is the default.

The selected COM Port is saved in application data and the software attempts to reload it on every start up.

2.2. Obtaining Unique ID

The PC utility automatically attempts to run HART command 0 on start up. This command obtains the Device Type ID, which is required for running any other commands. If the status field shows any errors on start up, then check communication settings and attempt command 0 again. *Without successful command 0 execution, no other communication with the target device is possible.*

2.3. System Configuration Tab

Importing and Exporting Data

File -> Save

This command will save all data in the System Table and Flow Table into a .lin file.

File -> Load

This command will load data into the System Table and Flow Table from previously saved .linfile.

Save Curve

This command will save Curve Table into a .fcv file.

Load Curve

This command will load a Curve Table from a .fcv file.

File Transfer Read Commands

Read System

On successful execution, the system table and the flow table will be populated with the data returned from the unit.

Extract Logs

On successful execution, the software will extract the 256 logs from the unit FRAM memory that detail the overspeeding history of the target device.

File Transfer Write Commands

The master password entered in the Password box allows the system to be programmed.

Currently, only one master password exists, which allows overwriting all data, including manufacturer settings. It is anticipated that only Litre Meter and LMM Designs know this password. In the future revisions, a second password will be included, which is targeted to be used by the operator to modify configuration data.

Lock/Unlock Manufacturer Settings

The greyed out fields are those that can only be modified with the master password. Once the correct password is entered, the "Lock/Unlock Manufacturer Settings" will unlock those fields formodifying.

Write Protect ON

This will set write protection, which will prevent writing to the device using HART commands.

Write Protect OFF

This will remove write protection, which will allow writing to the device using HART commands.

Program System

This will program the system, using the System Table and the Fluid Data (only if the password is correct).

Write Device ID

This command will program the device ID of the HART unit. This requires a special password. The device ID has to be unique for every manufactured device of the same type. This is only ever done once.

System Table Commands

The commands to the right of the table allow the operator to modify the system parameters (the modified system parameter is directly to the left of the relevant button). These commands use device specific HART commands (in the range 200-215).

Custom Command

The custom command functionality allows the operator to send any command to the target device, by specifying the command number and the data to be transmitted.

Feedback and Status

The FlowPod software provides feedback data to the user to investigate potential issues.

The Rx Data box displays the received data stream from the target device.

The Status box displays the returned status extracted from the HART response message from the unit (detected by the target device).

The box to the right of the status box displays communication issues (detected by the PC Software).

The progress bar is used for long duration commands, currently Read System, Program System and Extract Logs.

2.4. System Data Fields

Serial Number	Unique Serial ID
Cut-off (Frequency)	Flow is set to 0 when below this frequency.
Crystal Factor	Adjustment factor to get correct flow
Primary Variable Upper Limit	Upper flow limit of the meter (above this value the status will be set to POOR ACCURACY)
Primary Variable Lower Limit	Lower flow limit of the meter (below this value the status will be set to POOR ACCURACY)
Minimum Span	Minimum span between upper and lower range (see below)
Maximum Frequency	Above this frequency, over-speeding condition will be logged.
Time Over Frequency	The total time the meter runs over Maximum Frequency value. Reset this value by writing 0.
Maximum Hz Recorded	Maximum frequency the meter recorded
Total ON Time	Total time with power
Total Time with Flow	Total time with flow
Total Flow	Total flow (non operator resettable)
Total Resettable Flow	Total flow (operator resettable)
Distributor Code	Distributer code as defined by HART
Flow Units (Hart Enum)	Units code as per Table 2 of HART spec 183. All fields highlighted in Orange must be specified in this unit.
Flow Units Display String	Display string on the LCD. Can be left blank so that a pre- programmed default string is used for the chosen unit.
Flow Factor	Adjustment factor to get correct flow
Total Units (Hart Enum)	Units code as per Table 2 of HART spec 183. All fields highlighted in Blue must be specified in this unit.
Total Units Display String	Display string on the LCD. Can be left blank so that a pre- programmed default string is used for the chosen unit.
Total Factor	Adjustment factor to get correct total. Only applied to new total that is added.
Input Type	Input type: see table Input Type.
Digital Output Configuration	Currently not implemented
Pulse Scale	Currently not implemented

Serial Number	Unique Serial ID
Pulse Width	Currently not implemented
Backlight Colour	The LCD backlight colour for normal condition (4 wire only)
High Alarm PV Value	High alarm flow (above this value additional status will be set)
High Alarm Backlight Colour	The LCD backlight colour for high alarm condition (4 wire only)
Low Alarm PV Value	Low alarm flow below this value additional status will be set)
Low Alarm Backlight Colour	The LCD backlight color for low alarm condition (4 wire only)
Linearization	Whether the flow is linearized using the meter factor/K-Factor (1 uses K- Factor, 0 uses flow table)
K-Factor/meter factor	K-Factor used when linearized
Update Rate	How often flow is refreshed. Entry below 0.1 s will be limited to 0.1 s.
Cut-off Time	How long the device waits to see a pulse
Damping Value	Damping value, applied to the flow but no the total
Lower PV Range (4 mA)	The flow value corresponding to 4 mA output
Upper PV Range (20 mA)	The flow value corresponding to 20 mA output
Country Code	2 letter code of intended installation (HART variable)
Flow Table Units Code	This unit must correspond to the units of the flow curve.

Input Type

Input Type Number	Input Type
1	Pull Up
2	Pull Down
3	Namur
4	Pull Up & Debounce
5	Pull Down & Debounce
6	Namur & Debounce
7	Sine wave

2.5. Units

The implementation of the device software uses pre-defined conversion factors to convert between predefined HART units. For example, the unit can be programmed in in LTR/MIN (HART unit 17), but the operator can choose to output and display the flow in Gallons Per day (HART unit 235). The target device will automatically convert to the value to the required units, and automatically pick the relevant display string for the LCD from predefined values, unless it is overwritten using the Program Data command.

The implementation allows the unit to be programmed in any HART unit and the output to be converted into any HART unit.

The same applies to the total flow value - the output unit can be changed by the operator.

It is also possible to use the combination of flow factor/total factor and the display string entry in the System Data to adjust the value to a non HART unit (although the HART unit value will then beincorrect).

The HART unit for both flow and total can be changed using either the File Transfer (using relevant entry in the system table) or using commands 44 and 53 from the Hart Commands tab.

2.6. HART Commands Tab

This tab allows the user to communicate to the HART device using all Universal and some Common Practice Commands.

Green is for command 0, which must be run before attempting to transmit any other commands (it is also attempted automatically on start up by the software).

Yellow buttons are for write commands and they are positioned to show the affected fields, the size reflecting the number of affected fields, and the location of the button which fields are modified.

Grey buttons are for read commands and those are positioned in the same way as the yellow button commands to reflect the extent of the command.

Red button is for command 42, which issues a reset command to the target device.

Each button on this screen displays a tooltip when hovered over to provide information of the button functionality.

Similar feedback and status is provided as in the previous tab.

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