Engineering Note: EN0064 Using Hydronix digital sensors with legacy Hydronix products

Summary: Settings needed when using sensors in compatibility mode with the Hydro-Control IV (HC04) and Hydro-View (HV02, HV03).

Products affected:

Hydro-Mix Model numbers: HM05, HM06 and HM07.

Hydro-Probe Model number: HP02.

Hydro-Probe XT Model Number: HPXT

Hydro-Probe Orbiter Model numbers: ORB1 and ORB2.

Hydro-Control: Model number: HC04.

Hydro-View Model numbers: HV02 and HV03.

All other sensors do not have the compatibility facility

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1 Introduction

This document explains the settings that need to be adjusted or checked when using a digital Hydronix sensor with an older control (HC04) or display (HV02, HV03).

There is a cable available that converts between the older plastic 6-way Bulgin connector to the newer metal 12-way MIL-Spec connector for the new sensors. The part number for this is:

4m Compatibility Cable: 0069

A standard mode sensor can be used but the configuration will need to be changed using a PC running Hydro-Com which must be able to connect to the sensor using the RS485 interface.

2 Filtering Overview

One major difference between the older analogue style of Hydronix sensors (ie. the HM04 and the HP01) and digital sensors (the HM06 and HM07 and the HP02) is that the digital sensors have filters built into them which allows the noise in the signal from the process to be reduced or removed.

The sensors have two different types of filters.

2.1 Slew Rate Filters

The slew rate filter is applied to the signal first, and checks the difference between the new raw Unscaled reading and the last filtered Unscaled reading. If this difference is more than a set amount, then it limits the change to that amount. There are four settings for the slew rate filters, and one filter for positive changes (new value is higher than the existing one) and one filter for negative (new value is lower than the existing one)

2.2 Smoothing Filter (also known as Filtering Time)

This filter takes an average of a set number of the previous readings as they come out of the slew rate filter at 25 times per second. As a new reading arrives the oldest reading is discarded. The setting for this filter is in seconds and defines the number of readings that the average is taken over. As an example, if the filter is set to 10 seconds then the average is over the last 250 readings.

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3 Filtering in legacy products

The HC04 and HV02 and HV03 systems all had filtering built into their software. If a new sensor is used as a replacement with no change to any of the configurations, then this may cause problems with the speed of response of the system. This is because the readings from the sensor are sent through two sets of filters, which slows the signal changes.

The recommended correction for this is to remove the filtering from the HV02 or HC04 and leave the sensor settings as per the factory defaults. This means that if a sensor is replaced then the new sensor can be used immediately without extra modification.

To remove the filtering on either the HC04 or the HV02 or HV03, go to the Main Menu and choose “Sensor setup”. Record the current settings and make the following modifications:

Samples = 1

+dV Coarse = 0.00

-dV Coarse = 0.00

+dV Fine = 0.00

-dV Fine = 0.00

Some systems may need further adjustment from the default filtering. With these systems it is recommended to start with the process above and then to adjust the filtering so that the system works correctly.

It is also possible to change the filter settings in the sensor. This is described the Relevant Hydro-Com User Guide which is available from www.hydronix.com. To do this an RS-485 adapter and a PC running Hydro-Com will be needed.

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