

Engineering Note: EN0083 Hydro-Link Protocol Extensions for HS0102 Sensors

Summary:	The Hydro-Link Protocol has been extended to support sensors running HS0102 firmware. This Engineering Note describes those extensions that may affect a customer implementation of the Protocol.					
Products affected:	HM08, HP04, XT02, ORB3					
Revision Date:	12 th August 2015	Author:	A.	Smith		

Summary

Hydronix new range of sensors (running HS0102 firmware) has introduced a number of new features, which have required extensions to the Hydro-Link Protocol. The majority of these will have no impact on existing implementations of the Protocol in customers' control systems.

This does not affect customers who only use the analogue current loops, or who use Hydro-Com v2.0.0 or later, Hydro-Control VI or Hydro-View IV to configure the sensors.

It is assumed that the reader of this Engineering Note has a good understanding of the Hydro-Link Protocol. Full details of the Hydro-Link Protocol are available from Hydronix in document HD0621.

Significant Protocol Extensions

There are two messages in the extended version of the Protocol which return data in a different format to previous versions. These are messages R6 and R29, both of which relate to the Analogue Current Loop Output Variable setting:

#	Parameter	Dir	Data Format	Description
6	Config Output 1 Variable	rw	Defined Integer values : 0 : Raw Moisture 1 : Filtered Moisture	Defines which measured variable is output on the analogue output
or	or		2 : Average Moisture	If the additional parameter is
29	Config Output 2 Variable		 3 : Raw Unscaled 4 : Filtered Unscaled 5 : Average Unscaled 6 : Remote Value 7 : Brix 8 : Not Used 9 : Material Temperature 10 : Raw Unscaled 2 11 : Filtered Unscaled 2 Option 7 is only available on HydroTrac products. Options 0 to 5 take an additional parameter (separated by a space) to indicate which Measurement Mode is returned. F : Mode F V : Mode V E : Mode E Blank : Legacy Mode, use Unscaled1Type setting	If the additional parameter is omitted, the Unscaled1Mode or Unscaled2Mode setting will be used to determine the output variable mode.



In previous implementations, the sensor did not support multiple measurement modes and therefore did not include a specification for the measurement mode to output. The table below shows examples of the differences in the replies sent by the sensors to the requests R6 or R29:

Example Replies from Sensors to requests R6 or R29						
Output Value Setting	Original Protocol Version	Extended Protocol Version				
Filtered Unscaled (Mode F)	4	4 F				
Filtered Unscaled (Legacy Mode)	4	4				
Average Moisture (Mode E)	2	2 E				
Material Temperature	9	9				

Therefore in the extended implementation of the Hydro-Link Protocol, the sensor may return a letter following the Output Variable specification indicating which of the Measurement Mode values is to be output on the current loop. New sensors shipped from Hydronix will have Analogue Output 1 Variable set to **Filtered Unscaled Mode F** and Analogue Output 2 Variable set to **Material Temperature**. The Analogue Output 2 Variable setting will therefore not cause any problems, as this value does not take a mode specifier.

Many robust implementations of the Hydro-Link Protocol will handle this change smoothly, even though the extra information may not be used in the control system. In a more basic implementation, it will be necessary to modify the protocol software to accept the extra letter, even if the information is not used.

Ideally, a robust implementation of the Protocol will tolerate extra spaces before, after or between data values and ignore any following data that is not required or understood. This will provide a solid future-proof implementation which will cause a lot less problems when interfacing to different generations of Hydronix sensors in the future.

Write commands to these parameters using the original format will simply put the sensor into Legacy Mode, where the Unscaled1Type setting determines the output mode.

Workaround

If it is not possible to modify the Protocol implementation, the alternative workaround is to preconfigure the analogue output using Hydro-Com v2.0.0 or later to be set to **Filtered Unscaled – Legacy** prior to connecting to a customer control system.

Slow Trend Messages

Slow Trend messages R86 – R91 and R106 – R111 are no longer supported in HS0102 sensors.

Further Information

Further information on these changes and copies of the full Hydro-Link Protocol Specification is available from Hydronix Technical Support.