

X2 HART® Protocol

KOSO AMERICA has implemented a basic version of the HART Protocol Revision 5.0 in the X2 product. This implementation utilizes the Universal Commands as well as a limited number of Common Practice and Device Specific Commands. This implementation eliminates the need for a specific Device Driver (DD). When a field instrument is polled, it will report Universal and Common Practice Commands. These commands include Device Status and the Dynamic Variables. The Dynamic Variables are Position (the Primary Variable) and Cylinder Pressure Differential (optional).

Note: Pressure differential is only available if the actuator is equipped with the appropriate pressure transducers. These transducers are not included in the HART option; they must be specified as additional equipment. Availability of pressure transducers may be limited by other construction details.

Device Status reports information about the current condition of the unit, such as control modes or errors. Command #48 will identify if the unit has been taken out of Auto Mode and placed into Local Manual or Remote Manual modes. However, these modes can only be changed via the local control display. HART is disabled when the unit is placed in the Set-Up or calibration mode.

Device Status will also report any of the following active errors:

Main Feedback failure	Accumulator requires recharge*
Seat Load Cylinder failure*	Bad keypad
Control signal failure	EEPROM erase failure
Actuator direction error	Pulse board missing
-15v supply failure	A/D failure
+15v supply failure	CPU failure
Seat Load Cylinder stall*	Open direction pressure bad*
Actuator stall	Close direction pressure bad*
Motor drive fault	Temperature too low*
Bad pressure reading*	Low oil**

* May not apply to all models.

In addition to the Dynamic Variables, Universal Commands also read and write information used by the network, to identify each device. This includes information such as; device manufacturer, device codes, input signal, tag numbers, final assembly number and a 32 character message text. In addition to Device Status, the Common Practice Commands allow the unit to be set to operate in Burst Mode.

It should be noted that the new X2 software does maintain additional information that is extremely helpful in analyzing predictive maintenance, such as accumulated travel, reversals and error history. While this information is not available via the HART protocol, it is easily accessible through the new control display or via our FOUNDATION fieldbus™ solution. We currently do not offer initial position or signal calibration via HART or FF due to the potential damage that could result from attempting to remotely calibrate the unit. However, all other control parameters are readable and settable via the FOUNDATION fieldbus option.