Crystal Engineering Model 30 Series Communication Parameters

RS-232 Interface

All Model 30 series products are programmed and calibrated through an RS-232 interface. The port can also be used to collect both displayed and internal data, and all front panel keys can be actuated with the exception of the Contrast and ON/OFF keys.

Use of the port requires a special cable, Crystal P/N 1928. This is a 6-foot cable that adapts the 9-pin AMP connector on the unit to a standard DB9 female connector.

The interface contains optical isolation, so that there is no direct electrical connection between the internal circuits and the external RS232 interface. This eliminates the possibility of ground loops, which may affect the accuracy of measurements. It also presents an electrically dead connection (vs. live, exposed pins) when the unit is used in areas requiring intrinsic safety.

However, to make this work, power for the port has to be provided by the host computer. Pin 4 (DTR) and Pin 7 (RTS) from the host computer supply the power to the interface. They must be set to opposite voltages. Either pin can be set high providing the other pin is set low.

The interface is configured for 4800 baud, 8 bits, 1 stop and 1 start bit, no parity. This cannot be changed.

RS- 232 Command Set

The Model 30 series products respond to one or two byte commands. Two byte commands are used to distinguish between P1 and P2, for the Zero and Units keys.

Command (ASCII)	Operand	Description	Response	Notes
Z	“1" or “ 2" ASCII	Zero / Tare	Same as pressing P1 or P2 ZERO key	
C	(none)	Continuous Data Collection	See Table below	
S	(none)	STOP collecting data		
P	“1" or “ 2" ASCII	P1 or P2 units key	Same as pressing P1 or P2 UNITS key	
m	(none)	Press mA key	Same as pressing mA key	

RS-232 Data Strings

Once an ASCII “C” is sent, the unit will begin transmitting 31 byte, fixed length ASCII strings. The data string is identified by the prefix has deli-meters between fields and a line terminator that reflects battery condition. The last character of the 31-byte string is one of three battery status characters. If the battery is good the character is “>”. If the battery is low the character is “<” and if the battery is dead (too low for accurate operation) the character is a question mark (?).

Data string format table.

Prefix (3 bytes)	Deli-meter	Data	Deli-meter	Data	Deli-meter	Data	Termi-nator
P(S)(R) S=Sensor # R=Range #	,	8 bytes of direct ADC output	,	8 bytes of displayed data	‘	8 bytes of internal offset/tare value	*
mA(R) R=Range #	,	8 bytes of direct ADC output	,	8 bytes of displayed data	(none)	18 bytes of ASCII spaces	*
P(S)T S=Sensor #	,	8 bytes of direct ADC output of sensor temperature signal	(none)	18 bytes of ASCII spaces	*		
Amb	,	8 bytes of direct ADC output of ambient temperature signal	(none)	18 bytes of ASCII spaces	*		
BxC x=Z for zero or x=S for span C= ADC Channel #	(None)	27 bytes of ASCII spaces. This is a background calibration of the analog to digital converter - no data.	*				

- Either “>” or “<” or “?”

The standard Model 33 ranges serial# 2262-xxxxxx are:

LP Sensor (Eight Ranges)
P11= “H2O, P12= mbar, P13= kg/cm2, P14= mmHg, P15=mmH2O, P16= kPa, P17= “Hg, P18= PSI

HP Sensor (Three Ranges)
P21= bar, P22= kPa, P23= PSI

HP Sensor (Five Ranges)
P21= kg/cm2, P22= bar, P23= Mpa, P24= kPa, P25= PSI