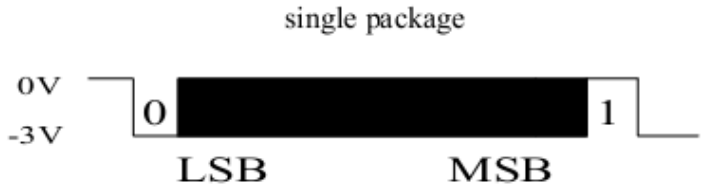
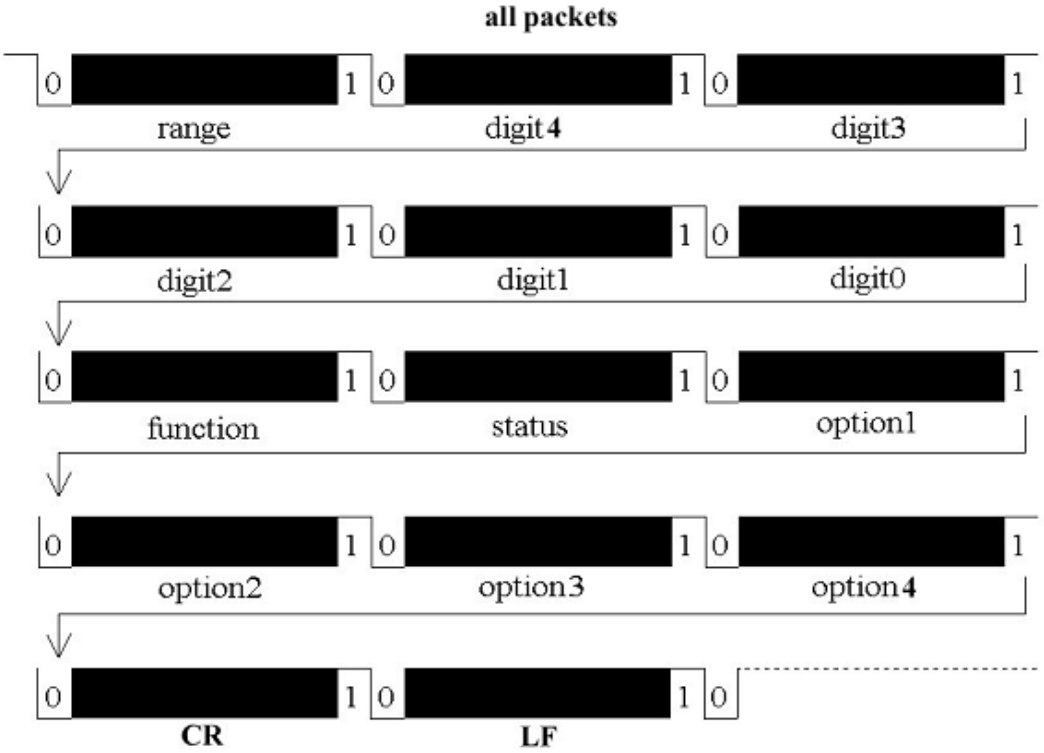
PeakTech 4090 Interface Protocol

4. Serial Data Output

The RS232 function will be activated if the RS232 pin is pulled to and asserts at V-. The serial data sent to **SDO** pin once every A/D conversion cycle. The data format complies with JIS 7Bits-transmission code with a baud rate of 19230. The host can use RS232 interface to read the data. A single data packet includes a start bit (always 0), 7 data bits, an odd parity check bit, and a stop bit (always 1). The high and low voltage levels correspond to DGND and V- respectively. SDO remains at 1 (high) when it is inactive. Hence the start bit (0) could be used as the triggering signal to begin the reading process. The following figure shows the data format of a single packet. The LSB is sent first and the MSB is sent last.



One data block consists of 14 packets, or 140 bits. The following figure shows the format of a data block. The range packet indicates the full scale range of the meter. Digit4 through digit0 are just the digits on the LCD panel. The function packet indicates the measurement mode of the meter. Status, option1~4 give the status of the meter. CR and LF are delimiters used to separate the blocks.



The meter always outputs the current input value to the serial port in spite of HOLD mode. The detailed data format of each packet is listed at next page.

4.1 FUNCTUON

This packet indicates the measurement mode of the meter. The following table summarizes the transmitted code for each mode. Note that the encoding of this packet is different from the encoding of FC1-FC5 switch.

Code	Measurement Mode	VBAR=0	VBAR=1
0111011	Voltage	Don't care	
0111101	Auto μA Current	Auto μA Current	Auto 220.00A/2200.0A
0111111	Auto mA Current	Auto mA Current	Auto 22.000A/220.00A
0110000	22 A current	Don't care	
0111001	Manual A Current		
0110011	Ω		
0110101	Continuity		
0110001	Diode		
0110010	[1]Frequency		
0110110	Capacitance		
0110100	[2]Temperature		
0111110	ADP		

1. When the function code = 0110010, the measurement mode is determined by judge bit of Status packet. If judge bit is 1, it means frequency mode. If judge bit is 0, it means duty cycle mode.
2. When the function code = 0110100, the judge bit in the Status packet determines whether the unit is Celsius or Fahrenheit. And the digit4~0 only presents Celsius value whatever the mode is ℃ or ℉.
3. When the function code = 0111101 or 0111111, the measurement mode is determined by VBAR bit.

4.2 RANGE

This packet indicates the full-scale range of the meter. When the meter operates in continuity mode or diode mode, this packet is always 0110000 since the full-scale ranges in these modes are fixed. The following table lists the code for each range in each measurement mode.

Code	V	*2-range auto A	22 A	Manual A	ADP	Ω	Frequency	Capacitor
0110000	2.2000V	Lower Range(IVSL)	22.000 A	2.2000A	ADP4	220.00Ω	22.00Hz	22.000nF
0110001	22.000V	Higher Range(IVSH)		22.000A	ADP3	2.2000KΩ	220.0Hz	220.00nF
0110010	220.00V			220.00A	ADP2	22.000KΩ		2.2000μF
0110011	2200.0V			2200.0A	ADP1	220.00KΩ	22.000KHz	22.000μF
0110100	220.00mV			22000A	ADP0	2.2000MΩ	220.00KHz	220.00μF
0110101						22.000MΩ	2.2000MHz	2.2000mF
0110110						220.00MΩ	22.000MHz	22.000mF
0110111							220.00MHz	220.00mF
*It includes auto μA, mA, 22.000A/220.00A, 220.00A/2200.0A.								

4.3 DIGIT 4 – DIGIT 0

Digit 4 is the first significant digit on the LCD panel, and digit 0 is the least significant digit.

Digit	Code
0	0110000
1	0110001
2	0110010
3	0110011
4	0110100
5	0110101
6	0110110
7	0110111
8	0111000
9	0111001

4.4 STATUS

The format of this package shown below. The Judge field is meaningful only when the Function packet indicates Temperature mode. In Temperature mode, judge is 1 if the unit is ℃ and is 0 of the unit is °F. Sign field indicates whether the minus sign on the LCD panel is on or off. BATT field is one when battery low condition is true. OL indicates input overflow.

0	1	1	Judge	Sign	BATT	OL
BIT6	BIT 5	BIT 4	BIT 3	BIT 2	BIT1	BIT 0

4.5 OPTION 1

This packet contains information on the push function of the meter. The format is shown below. MAX, MIN or RMR bit will be high if the meter enter Max/Min function and stay at state of maximum, minimum or current value respectively. REL bit will be high if meter enters REL/Zero mode.

0	1	1	MAX	MIN	REL	RMR
BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0

4.6 OPTION 2

0	1	1	UL	0	0	0
BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT1	BIT 0

Under the following conditions, the UL bit will be set to 1.

1. In 22.00Hz range, the input frequency is less than 2.00Hz.
2. In 220.0Hz range, the input frequency is less than 20.0Hz.
3. In duty cycle mode, the reading is less than 10.0%.

4.7 OPTION 3

This packet contains information on the operation mode of the meter. The format is shown below. The DC field indicates that the meter operates in DC measurement mode, either voltage or current. The AC field indicates that the meter operates in AC measurement mode, either voltage or current. The AUTO field is set to one if the meter operates in automatic mode, and is set to zero when the meter operates in manual mode.

0	1	1	DC	AC	AUTO	VAHZ
BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0

4.8 OPTION4

This packet contains information on the operation mode of the meter. The format is shown below. VBAR will be set to high, only when the VBAR pin is connected to V-. Hold bit is set to high when meter enters hold mode. LPF bit is set to high when the low-pass-filter feature is activated.

0	1	1	0	VBAR	Hold	LPF
BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0

4.9 CR

Carriage returns. The transmitted code is 0001101.

4.10 LF

Line feed. The transmitted code is 0001010.