Introduction

This supplement provides a listing of all registers used for storing and controlling data in the meter. Some of these registers can be accessed during meter configuration. Configuration can be done either through the front panel buttons or via a PC using the manufacturer's Meter Configuration Utiltiy program.

The registers are also available for use with a macro on T Series meters. Macros can be pre-configured into the meter by the manufacturer, or written and uploaded to the meter by the user via the manufacturer's Macro Compiler program.
See TDS Compiler Tutorial (NZ212) for more details

The meter uses 8, 16, and 32-bit signed, unsigned, and floating point registers. There are two types of register used in the meter:
- A configuration register.
- A working register.

Configuration Registers
A configuration register stores signal constants that change only when they are reprogrammed. For example, registers 25 and 28 store channel 1 input signal scale and offset settings set up in the calibration mode.

Working Registers
A working register stores signal data that changes regularly due to variations in the input signal, as well as the processes carried out by the meter's functions on the input signal. For example, register 4 stores the processed data for the input signal after it has been processed through the channel 1 functions programmed into the meter.

Chapters

1 Numerical Listing lists registers and descriptions numerically. This listing contains a full description for each register.

2 Functional Grouping groups register names and numbers by functional groups and acts as the index for this supplement.

3 Modbus Registers describes how Modbus registers correlate with ASCII register numbers.

Symbol Types

The Type column uses the following abbreviations to identify the register type:

- B_ The symbol B_ is followed by a number from 0 to 31 and describes the register bit number.
- F_32 The symbol F_32 identifies the register as a floating point 32-bit register.
- _R The symbol _R identifies the register as a read only register.
- S_ The symbol S_ is followed by either 16, 24, or 32, identifying the register as a 16, 24, or 32-bit signed integer.
- _T The symbol _T indicates that the register is reserved for testing purposes by Texmate.
- U_ The symbol U_ is followed by either 8 or 16, identifying the register as an 8 or 16-bit unsigned integer.

Reg.	Type	Register Name	Register Description
1	U_16	**ALARM_STATUS**	16 bit value shows/controls status of Setpoints.
1	B_0	**SP1**	This flag shows/controls the status of setpoint 1 (On=setpoint actived).
1	B_1	**SP2**	This flag shows/controls the status of setpoint 2 (On=setpoint actived).
1	B_2	**SP3**	This flag shows/controls the status of setpoint 3 (On=setpoint actived).
1	B_3	**SP4**	This flag shows/controls the status of setpoint 4 (On=setpoint actived).
1	B_4	**SP5**	This flag shows/controls the status of setpoint 5 (On=setpoint actived).
1	B_5	**SP6**	This flag shows/controls the status of setpoint 6 (On=setpoint actived).
1	B_6	**TREND_UP**	When On, this flag indicates an upward trend in the display data value.
1	B_7	**TREND_DOWN**	When On, this flag indicates a downward trend in the display data value.
1	B_8	**SP1_REMOTE**	Setting this bit to On places setpoint 1 in remote mode.
1	B_9	**SP2_REMOTE**	Setting this bit to On places setpoint 2 in remote mode.
1	B_10	**SP3_REMOTE**	Setting this bit to On places setpoint 3 in remote mode.
1	B_11	**SP4_REMOTE**	Setting this bit to On places setpoint 4 in remote mode.
1	B_12	**SP5_REMOTE**	Setting this bit to On places setpoint 5 in remote mode.
1	B_13	**SP6_REMOTE**	Setting this bit to On places setpoint 6 in remote mode.
2	S_32	**DISPLAY**	32 bit register holds the data for the primary display.
3	S_32	**RESULT_PROCESSED**	32 bit register holds the processed data for the result channel.
4	S_32	**CH1_PROCESSED**	32 bit register holds the processed data for channel 1.
5	S_32	**CH2_PROCESSED**	32 bit register holds the processed data for channel 2.
6	S_32	**SETPOINT1**	32 bit register holds the setpoint activation value for setpoint 1.
7	S_32	**SETPOINT2**	32 bit register holds the setpoint activation value for setpoint 2.
8	S_32	**SETPOINT3**	32 bit register holds the setpoint activation value for setpoint 3.
9	S_32	**SETPOINT4**	32 bit register holds the setpoint activation value for setpoint 4.
10	S_32	**SETPOINT5**	32 bit register holds the setpoint activation value for setpoint 5.
11	S_32	**SETPOINT6**	32 bit register holds the setpoint activation value for setpoint 6.
12	S_32	**PEAK**	Maximum value since last reset.
13	S_32	**VALLEY**	Minimum value since last reset.
14	S_32	**TARE**	Tare offset value currently set.
16	S_32	**TOTAL1**	32 bit value for totalisator 1.
17	S_32	**TOTAL2**	32 bit value for totalisator 2.
18	S_32	**RESULT_RAW**	32 bit register holds the raw result data, prior to scaling and post processing.
19	S_32	**CH1_RAW**	32 bit register holds the raw data for channel 1, prior to scaling and post processing.
20	S_32	**CH2_RAW**	32 bit register holds the raw data for channel 2, prior to scaling and post processing.
21	S_32	**RESULT_SCALED**	32 bit register holds the scaled result data, before any post processing.
22	S_32	**CH1_SCALED**	32 bit register holds the scaled data for channel 1, before any post processing.
23	S_32	**CH2_SCALED**	32 bit register holds the scaled data for channel 2, before any post processing.
24	F_32	**SCALE_FACTOR_RESULT**	32 bit floating point register holds the calibration scale factor for the result channel.
25	F_32	**SCALE_FACTOR_CH1**	32 bit floating point register holds the calibration scale factor for channel 1.
26	F_32	**SCALE_FACTOR_CH2**	32 bit floating point register holds the calibration scale factor for channel 2.

Reg.	Type	Register Name	Register Description
27	S_32	**OFFSET_RESULT**	32 bit register holds the calibration offset for the result channel.
28	S_32	**OFFSET_CH1**	32 bit register holds the calibration offset for channel 1.
29	S_32	**OFFSET_CH2**	32 bit register holds the calibration offset for channel 2.
30	S_16	**D2A_AOP1_CAL_LOW**	16 bit register holds the low end calibration value for analogue O/P 1.
31	S_16	**D2A_AOP2_CAL_LOW**	16 bit register holds the low end calibration value for analogue O/P 2.
32	S_16	**D2A_AOP1_CAL_HIGH**	16 bit register holds the high end calibration value for analogue O/P 1.
33	S_16	**D2A_AOP2_CAL_HIGH**	16 bit register holds the high end calibration value for analogue O/P 2.
34	S_32	**D2A_AOP1_ZERO**	32 bit register holds the zero scale value for analogue O/P 1.
35	S_32	**D2A_AOP2_ZERO**	32 bit register holds the zero scale value for analogue O/P 2.
36	S_32	**D2A_AOP1_FULL_SCALE**	32 bit register holds the full scale value for analogue O/P 1.
37	S_32	**D2A_AOP2_FULL_SCALE**	32 bit register holds the full scale value for analogue O/P 2.
39	S_32	**CH3_PROCESSED**	32 bit register holds the processed data for channel 3.
40	S_32	**CH4_PROCESSED**	32 bit register holds the processed data for channel 4.
41	S_32	**CH3_RAW**	32 bit register holds the raw data for channel 3, prior to scaling and post processing.
42	S_32	**CH4_RAW**	32 bit register holds the raw data for channel 4, prior to scaling and post processing.
43	S_32	**CH3_SCALED**	32 bit register holds the scaled data for channel 3, before any post processing.
44	S_32	**CH4_SCALED**	32 bit register holds the scaled data for channel 4, before any post processing.
45	S_16	**CH1_PRESCALER_COUNT**	16 bit register give the current prescaler count value for channel 1 in counter mode.
46	S_16	**CH2_PRESCALER_COUNT**	16 bit register give the current prescaler count value for channel 2 in counter mode.
49	S_32	**EDIT_VALUE**	32 bit register holds the currently displayed value when in any edit mode.
50	U_16	**PID1_OUTPUT**	16 bit register holds a PID output value from 0-1000 when SP1 is set to PID mode.
51	U_16	**PID2_OUTPUT**	16 bit register holds a PID output value from 0-1000 when SP2 is set to PID mode.
52	F_32	**PID1_ERROR_SUM**	32 bit floating point register which cotains the error sum value for PID 1.
53	F_32	**PID1_INTEGRAL_TERM**	32 bit floating point register which cotains the integral term for PID 1.
54	S_32	**SMART_RESULT1**	32 bit register holds result 1 when a smart input module is used.
55	S_32	**SMART_RESULT2**	32 bit register holds result 2 when a smart input module is used.
56	S_32	**SMART_RESULT3**	32 bit register holds result 3 when a smart input module is used.
57	S_32	**SMART_RESULT4**	32 bit register holds result 4 when a smart input module is used.
58	S_32	**SMART_RESULT5**	32 bit register holds result 5 when a smart input module is used.
59	S_32	**SMART_RESULT6**	32 bit register holds result 6 when a smart input module is used.
60	S_32	**SMART_RESULT7**	32 bit register holds result 7 when a smart input module is used.
65	U_16	**SP1_HYST**	16 bit register holds the hysteresis/passband value for setpoint 1.
65	U_16	**PID1_PROPORTIONAL_BAND**	16 bit register sets the proportional band for PID1 from 0% to 999.9%(9999).
66	U_16	**SP2_HYST**	16 bit register holds the hysteresis/passband value for setpoint 2.

Reg.	Type	Register Name	Register Description
66	U_16	**PID2_PROPORTIONAL_BAND**	16 bit register sets the proportional band for PID2 from 0% to 999.9%(9999).
67	U_16	**SP3_HYST**	16 bit register holds the hysteresis/passband value for setpoint 3.
68	U_16	**SP4_HYST**	16 bit register holds the hysteresis/passband value for setpoint 4.
69	U_16	**SP5_HYST**	16 bit register holds the hysteresis/passband value for setpoint 5.
70	U_16	**SP6_HYST**	16 bit register holds the hysteresis/passband value for setpoint 6.
71	U_16	**SP1_MAKE_DELAY**	16 bit register holds the make delay time for setpoint 1(0.1s or 0.001s resolution).
71	U_16	**PID1_INTEGRAL_VALUE**	16 bit register sets the integral value for PID1 from 0 to 6553.5(65535).
72	U_16	**SP2_MAKE_DELAY**	16 bit register holds the make delay time for setpoint 2(0.1s or 0.001s resolution).
72	U_16	**PID2_INTEGRAL_VALUE**	16 bit register sets the integral value for PID2 from 0 to 6553.5(65535).
73	U_16	**SP3_MAKE_DELAY**	16 bit register holds the make delay time for setpoint 3(0.1s resolution).
74	U_16	**SP4_MAKE_DELAY**	16 bit register holds the make delay time for setpoint 4(0.1s resolution).
75	U_16	**SP5_MAKE_DELAY**	16 bit register holds the make delay time for setpoint 5(0.1s resolution).
76	U_16	**SP6_MAKE_DELAY**	16 bit register holds the make delay time for setpoint 6(0.1s resolution).
77	U_16	**SP1_BREAK_DELAY**	16 bit register holds the break delay time for setpoint 1(0.1s or 0.001s resolution).
77	U_16	**PID1_DERIVATIVE_VALUE**	16 bit register sets the derivative value for PID1 from 0 to 999.9(9999).
78	U_16	**SP2_BREAK_DELAY**	16 bit register holds the break delay time for setpoint 2(0.1s or 0.001s resolution).
78	U_16	**PID2_DERIVATIVE_VALUE**	16 bit register sets the derivative value for PID2 from 0 to 999.9(9999).
79	U_16	**SP3_BREAK_DELAY**	16 bit register holds the break delay time for setpoint 3(0.1s resolution).
80	U_16	**SP4_BREAK_DELAY**	16 bit register holds the break delay time for setpoint 4(0.1s resolution).
81	U_16	**SP5_BREAK_DELAY**	16 bit register holds the break delay time for setpoint 5(0.1s resolution).
82	U_16	**SP6_BREAK_DELAY**	16 bit register holds the break delay time for setpoint 6(0.1s resolution).
83	S_16	**ANALOG_OUTPUT1**	16 bit register holds the scaled output data for analogue O/P 1.
84	S_16	**ANALOG_OUTPUT2**	16 bit register holds the scaled output data for analogue O/P 2.
85	S_32	**VARIABLE1**	32 bit register used by the macro for variable space.
86	S_32	**VARIABLE2**	32 bit register used by the macro for variable space.
87	S_32	**VARIABLE3**	32 bit register used by the macro for variable space.
88	S_32	**VARIABLE4**	32 bit register used by the macro for variable space.
89	S_32	**VARIABLE5**	32 bit register used by the macro for variable space.
90	S_32	**VARIABLE6**	32 bit register used by the macro for variable space.
91	S_32	**VARIABLE7**	32 bit register used by the macro for variable space.
92	S_32	**VARIABLE8**	32 bit register used by the macro for variable space.
93	S_32	**VARIABLE9**	32 bit register used by the macro for variable space.
94	S_32	**VARIABLE10**	32 bit register used by the macro for variable space.
95	U_32	**TIMER1**	32 bit timer counts up every 0.1 seconds. It can be set/reset by macro.
96	U_32	**TIMER2**	32 bit timer counts up every 0.1 seconds. It can be set/reset by macro.
97	U_16	**CH1_PRESCALER**	16 register sets the prescale value in channel 1 counter mode. Although this is a 16 bit unsigned register it's allowable data range is only from 1 to 32767.

Reg.	Type	Register Name	Register Description
98	U_16	**CH2_PRESCALER**	16 register sets the prescale value in channel 2 counter mode. Although this is a 16 bit unsigned register it's allowable data range is only from 1 to 32767.
99	S_32	**BAR_LOW**	32 bit register holds the bar graph low end value (for bar graph meters only).
100	S_32	**BAR_HIGH**	32 bit register holds the bar graph high end value (for bar graph meters only).
101	U_16	**BAR_COLOUR**	16 bit register sets the bar graph colour bands between setpoints (for bar graph meters only).
102	F_32	**SCALE_FACTOR_CH3**	32 bit floating point register holds the calibration scale factor for channel 3.
103	F_32	**SCALE_FACTOR_CH4**	32 bit floating point register holds the calibration scale factor for channel 4.
104	S_32	**OFFSET_CH3**	32 bit register holds the calibration offset for channel 3.
105	S_32	**OFFSET_CH4**	32 bit register holds the calibration offset for channel 4.
106	S_32	**RECEIVE_RESULT**	32 bit register holds the 1st numeric value received in a string via the serial port.
107	F_32	**VARIABLE11**	32 bit floating point register used by the macro for variable space.
108	F_32	**VARIABLE12**	32 bit floating point register used by the macro for variable space.
109	F_32	**VARIABLE13**	32 bit floating point register used by the macro for variable space.
110	F_32	**VARIABLE14**	32 bit floating point register used by the macro for variable space.
111	F_32	**VARIABLE15**	32 bit floating point register used by the macro for variable space.
112	F_32	**VARIABLE16**	32 bit floating point register used by the macro for variable space.
113	F_32	**VARIABLE17**	32 bit floating point register used by the macro for variable space.
114	F_32	**VARIABLE18**	32 bit floating point register used by the macro for variable space.
115	S_32	**SP1_RESET_VALUE**	32 bit register holds the reset value used with setpoint 1 trigger functions.
115	S_32	**PID1_SPAN**	32 bit register sets the span value for PID1 from 0 to 99999.
116	S_32	**SP2_RESET_VALUE**	32 bit register holds the reset value used with setpoint 2 trigger functions.
116	S_32	**PID2_SPAN**	32 bit register sets the span value for PID2 from 0 to 99999.
117	S_32	**SP3_RESET_VALUE**	32 bit register holds the reset value used with setpoint 3 trigger functions.
118	S_32	**SP4_RESET_VALUE**	32 bit register holds the reset value used with setpoint 4 trigger functions.
119	S_32	**SP5_RESET_VALUE**	32 bit register holds the reset value used with setpoint 5 trigger functions.
120	S_32	**SP6_RESET_VALUE**	32 bit register holds the reset value used with setpoint 6 trigger functions.
121	S_32	**SMART_RESET_OFFSET1**	Registers 121 & 122 are 32 bit reset offset registers which are used with certain types of smart input modules. A write to register 121 or 122 will cause the smart input module to reset it's result register 1 or result register 2 respectively. If the data value written to these registers is zero, then the smart input module will write a zero into the appropriate result register. If the data value written to these registers is other than zero, then the smart input module will treat this as an offset and subtract the data value from the appropriate result register. A read of these registers will read the last offset value which was written to input module.
122	S_32	**SMART_RESET_OFFSET2**	

Reg.	Type	Register Name	Register Description
129	O_8	**CAL**	Registers 129 – 139 are 8 bit registers used to control the functionality of the meter. The function of each register is described in the DI50T+ Codes document. When reading or writing to these registers via the serial port, the data is treated in octal format so that it is identical to the value shown on the display of the meter when setting the codes up manually. The function selected in the first digit of each Code register is stored in bits 6&7. The function selected in the second digit of each Code register is stored in bits 3,4, &5. The function selected in the third digit of each Code register is stored in bits 0,1, &2. For example, if the manual setup for Code4 shows 241, then reading register 133 in ASCII mode will result in a value of 241. Converting this octal value to a binary or hex equivalent gives 0A1 hex or 10100001 binary. Octal 2 4 1 Binary 10 100 001 1st digit 2nd digit 3rd digit
130	O_8	**CODE1**	
131	O_8	**CODE2**	
132	O_8	**CODE3**	
133	O_8	**CODE4**	
134	O_8	**CODE5**	
135	O_8	**CODE6**	
136	O_8	**CODE7**	
137	O_8	**CODE8**	
138	O_8	**CODE9**	
139	O_8	**CODE10**	
142	O_8	**SP1_CONTROL**	These registers are 8 bit registers used to control the setpoint functionality. When reading or writing to these registers via the serial port, the data is treated in octal format so that it is identical to the value shown on the display of the meter when setting these codes up manually. The format of these registers is the same as registers 129 – 139 described above.
143	O_8	**SP2_CONTROL**	
144	O_8	**SP3_CONTROL**	
145	O_8	**SP4_CONTROL**	
146	O_8	**SP5_CONTROL**	
147	O_8	**SP6_CONTROL**	
148	U_8	**BRIGHTNESS**	This is an 8 bit register used to control the brightness of an LED display meter or the contrast of some LCD display meters. A number between 0 and 7 can be written to register 148 to control the brightness.
149	U_8	**BAUDRATE**	Register 149 is an 8 bit register used to store the serial port settings for the meter. Bits 0 – 2 are used to hold the baud rate information. Bit 3 is used to select between 7 or 8 data bits and bits 4 & 5 are used to select the parity type. Bits 6 and 7 allow different transmit delay times to be selected. The various options available are shown below: Bits 7,6 = transmit delay (00 = 2mS, 01 = 20mS, 10 = 50mS, 11 = 100mS) Bits 5,4 = parity (00 = no parity, 01 = odd parity, 10 = even parity) Bit 3 = data bits (0 = 8 data bits, 1 = 7 data bits) Bits 2,1,0 = baud rate (000 = 300 baud (E meter only), 001 = 600 baud, 010 = 1200 baud, 011 = 2400baud, 100 = 4800 baud, 101 = 9600 baud, 110 = 19200 baud, 111 = 38400 baud (T meter only)) Note: If this register is modified via the serial port, the meter response (and any subsequent communications) will be issued at the new modified baud rate/ parity settings which may result in a communications error at the master device.
150	U_8	**SERIAL_ADDRESS**	This is an 8 bit register which sets the serial address of the meter. The meter address can be set from 1 to 255. The meter address should not be set to 0 as this address is reserved (all meters respond to a request at address zero).

Reg.	Type	Register Name	Register Description
151	U_16	**SWITCHES**	16 bit register contains flags for front panel switches. Register 151 is a 16 bit register used to read the status of the switches or to disable the front panel switches and manually control switch depressions from the serial port. An explanation of the function of each bit is given below: Bit 0 = Program Button (0 = off (open), 1 = on (closed)) Bit 1 = Down Button (0 = off (open), 1 = on (closed)) Bit 2 = Up Button (0 = off (open), 1 = on (closed)) Bit 3 = Lock up switch (0 = off (open), 1 = on (closed)) Bit 4 = Lock down switch (0 = off (open), 1 = on (closed)) Bit 5 = Func1 button (0 = off (open), 1 = on (closed)) Bit 6 = Func2 button (0 = off (open), 1 = on (closed)) Bit 7 = Func3 button (0 = off (open), 1 = on (closed)) Bit 8 = Reserved for future use Bit 9 = Reserved for future use Bit 10 = Reserved for future use Bit 11 = Reserved for future use Bit 12 = Reserved for future use Bit 13 = Reserved for future use Bit 14 = Reserved for future use Bit 15 = This bit disables operation of all front panel switches. If bit 15 of register 151 is 0 (normal mode of operation), a read of the register will show the current status of the above switches and input pins. A write to bits 0 – 6 while in the normal mode is not recommended and will produce an unreliable result.
151	B_0	**PROG_BUTTON**	
151	B_1	**DOWN_BUTTON**	
151	B_2	**UP_BUTTON**	
151	B_3	**LOCK_UP_SWITCH**	
151	B_4	**LOCK_DOWN_SWITCH**	
151	B_5	**F1_BUTTON**	
151	B_6	**F2_BUTTON**	
151	B_7	**F3_BUTTON**	
151	B_15	**REMOTE_SWITCH**	
152	U_16	**DIGITAL_IO**	Register 152 is a 16 bit register which shows the current status of the I/O pins on the back panel of the meter. The bit function for each bit is shown below. Bit 0 = Hold pin (1 = active state), 0 = inactive state) Bit 1 = Lock pin Bit 2 = Capture pin Bit 3 = D1 read only pin Bit 4 = D2 read only pin Bit 5 = D3 read only pin Bit 6 = COUNT2_INPUT read only pin Bit 7 = COUNT2_DIRECTION read only pin Bit 8 = MUX0 input pin on selected input modules (single Ch mode only). Bit 9 = MUX1 input pin on selected input modules (single Ch mode only). Bit 10 = Reserved for future expansion Bit 11 = Reserved for future expansion Bit 12 = Reserved for future expansion Bit 13 = Reserved for future expansion Bit 14 = Reserved for future expansion Bit 15 = Reserved for future expansion When register 152 is read, the status of all of the pins is sampled directly from the input pin. If register 152 is written to, the values specified are also written directly to the corresponding pins. NOTE: Because of the port structure of the 8051 microprocessor, a 0 written to a digital pin will configure it as an input with a weak pull-up. A 1 written to a pin will configure the pin as an output only, which is driven low. Care must be taken when writing to register 152 to ensure that a “0” is written to each bit that is required to be an input. Only Bits 0 – 2 are read/write registers. All other bits are read only pins. Also note that state of each bit in reg #152 is not the same as the actual voltage on the pin at the rear of the meter. This is because the inputs are high in their inactive state and are pulled low when active.
152	B_0_R	**HOLD_PIN**	
152	B_1_R	**LOCK_PIN**	
152	B_2_R	**CAPTURE_PIN**	
152	B_3_R	**D1**	
152	B_4_R	**D2**	
152	B_5_R	**D3**	
152	B_6_R	**COUNT2_INPUT**	
152	B_7_R	**COUNT2_DIRECTION**	
152	B_8_R	**MUX0**	
152	B_9_R	**MUX1**	
155	U_8	**VIEW_POINTER**	8 bit register indicates which value is currently being displayed in view mode (i.e. pressing up/down).

Reg.	Type	Register Name	Register Description
156	U_8	**RELAY_STATUS**	This 8 bit register is a read only register which shows the current status of the relays after the setpoint processing has been done. The difference between this register and register 1 (alarm status) is that the alarm status register shows the current status of the setpoints as opposed to the relays. For example a setpoint may have been activated but the relay may not yet be turned on because of a 10 second delay on make. In this case, reading the alarm status register (#1) would show the setpoint as active, but reading 156 would show that the relay had not yet turned on. An explanation of the bit functions for these registers is shown below: Relay Output Image Bit 0 = Relay 1 (0 = off, 1 = on) Bit 1 = Relay 2 (0 = off, 1 = on) Bit 2 = Relay 3 (0 = off, 1 = on) Bit 3 = Relay 4 (0 = off, 1 = on) Bit 4 = Relay 5 (0 = off, 1 = on) Bit 5 = Relay 6 (0 = off, 1 = on) Bit 6 = Don't care Bit 7 = Don't care
156	B_0	**RELAY1**	
156	B_1	**RELAY2**	
156	B_2	**RELAY3**	
156	B_3	**RELAY4**	
156	B_4	**RELAY5**	
156	B_5	**RELAY6**	
157	B_5	**NON_VOLATILE_WRITE**	Bit 5 of Register 157 is used by the macro only to enable a write to non volatile memory. Nearly all of the registers in the meter are situated in RAM (Random Access Memory) which looses it data when the meter is turned off. In some cases this is undesirable, so a second copy of the data is stored in non volatile memory, which retains it's data even when the meter is turned off. However, a physical limitation of this sort of memory is that each memory location can only be written 100,000 times in total. The non volatile write flag is provided so that those registers which have a copy in non volatile memory are can still be written to by the macro each cycle, without exceeding the maximum write limit. If bit 5 is set to a '1' then the next time the macro stores a value into a register it will write to RAM and update any associated non volatile memory locations as well. If bit 5 is set to a '0' then the time the macro stores a value into a register, it will only write to RAM. After each store instruction, the macro engine will automatically clear this flag to '0'. Note: The non volatile write flag only functions for macro commands. Any write to a register via the serial port will ALWAYS update the non volatile memory.
158	U_8	**CURRENT_DISPLAY_FORMAT**	Register 158 is an 8 bit read only register which shows the display options (rounding, display mode, decimal point selection) which are currently active on the display. The function of each bit is exactly the same as that for registers 199 – 205.
159	U_8	**CURRENT_ALPHA_CHARACTER**	Register 159 is an 8 bit read only register which shows the Alpha-numeric character which is currently active on the display. The value read from 159 is the ASCII code for the character. An ASCII null (0) indicates that no Alpha-numeric character is displayed.
161	U_8	**SECURITY_BYTE**	8 bit register contains security flags. Caution - writing to this byte will permanently disable meter functions.

Reg.	Type	Register Name	Register Description
162	U_8	**SP_POWERON_INHIBIT_FLAGS**	Register 162 is an 8 bit register which contains flags for the power-on inhibit function of the setpoints. The function of each bit is shown below; Setpoint Power-on Inhibit Bit 0 = Power-on Inhibit SP1 (0 = power-on inhibit active, 1 = power-on inhibit in-active) Bit 1 = Power-on Inhibit SP2 Bit 2 = Power-on Inhibit SP3 Bit 3 = Power-on Inhibit SP4 Bit 4 = Power-on Inhibit SP5 Bit 5 = Power-on Inhibit SP6 Bit 6 = Don't care Bit 7 = Don't care The power-on inhibit feature functions as follows. After power on, the register 162 is initially cleared to zero. As each setpoint is examined, the appropriate bit of register 162 is set only if the setpoint is in-active. A setpoint which has the power-on inhibit feature selected, can only activate the relay if the appropriate power-on inhibit bit is set. This means that the after reset, the setpoint must first enter the in-active state before it can be activated. This register can be read or written to.
162	B_0	**POWERON_INHIBIT_SP1**	
162	B_1	**POWERON_INHIBIT_SP2**	
162	B_2	**POWERON_INHIBIT_SP3**	
162	B_3	**POWERON_INHIBIT_SP4**	
162	B_4	**POWERON_INHIBIT_SP5**	
162	B_5	**POWERON_INHIBIT_SP6**	
163	U_16	**ANNUNCIATORS**	Register 163 is a 16 bit register which allows the user to take remote control of the LED annunciators on the front panel. The bit functions are shown below. Remote LED Bit 0 = SP LED 6 (0 = off, 1 = on) Bit 1 = SP LED 5(0 = off, 1 = on) Bit 2 = SP LED 4 (0 = off, 1 = on) Bit 3 = SP LED 3(0 = off, 1 = on) Bit 4 = SP LED 2(0 = off, 1 = on) Bit 5 = SP LED 1(0 = off, 1 = on) Bit 6 = Don't care Bit 7 = Don't care Bit 8 = Remote LED mode for SP LED 6 (0 = normal mode, 1 = remote mode) Bit 9 = Remote LED mode for SP LED 5 Bit 10 = Remote LED mode for SP LED 4 Bit 11 = Remote LED mode for SP LED 3 Bit 12 = Remote LED mode for SP LED 2 Bit 13 = Remote LED mode for SP LED 1 Bit 14 - 15 = Reserved for future use (these bits should be written as 0) A read of this register will always show the current LED status of all LED's whether in normal or remote mode.
163	B_0	**LED6**	
163	B_1	**LED5**	
163	B_2	**LED4**	
163	B_3	**LED3**	
163	B_4	**LED2**	
163	B_5	**LED1**	
163	B_8	**REMOTE_LED6**	
163	B_9	**REMOTE_LED5**	
163	B_10	**REMOTE_LED4**	
163	B_11	**REMOTE_LED3**	
163	B_12	**REMOTE_LED2**	
163	B_13	**REMOTE_LED1**	
164	U_8	**SP1_TRACKING**	Registers 164 – 169 are 8 bit registers used for selecting the setpoint tracking. The function of each bit is shown below; Setpoint tracking Bits 0 – 2 = Tracking mode. (xxxxx000b = tracking disabled) (xxxxx001b = Setpoint tracks SP1) (xxxxx010b = Setpoint tracks SP2) (xxxxx011b = Setpoint tracks SP3) (xxxxx100b = Setpoint tracks SP4) (xxxxx101b = Setpoint tracks SP5) (xxxxx110b = Setpoint tracks SP6) Bits 3 – 7 = Reserved for future development
165	U_8	**SP2_TRACKING**	
166	U_8	**SP3_TRACKING**	
167	U_8	**SP4_TRACKING**	
168	U_8	**SP5_TRACKING**	
169	U_8	**SP6_TRACKING**	

Reg.	Type	Register Name	Register Description
170	U_8	**DATA_SOURCE_DISPLAY1**	Registers 170 – 184 are 8 bit registers which specify the data source for various functions. The number they contain is the modbus register number (from 1 – 255) for the required data source. Modbus registers from 256 onwards cannot be selected as a data for functions. Register 171 & 172 are reserved for different models of meter were there are more than one display output. The function of registers 171 & 172 with different meter types is shown below; 8 x 2 Line LCD Display Meter 171 = Data source for 2nd line of display Bar Graph Meter 171 = Data source for bar graph. 3 Display Meter 171 = Data source for display 2. 172 = Data source for display 3. Note: Only registers that hold integer values can be used as a data source. Floating point and text registers can not be used.
171	U_8	**DATA_SOURCE_DISPLAY2**	
172	U_8	**DATA_SOURCE_DISPLAY3**	
173	U_8	**DATA_SOURCE_PEAK_VALLEY**	8 bit register holds the register number of the data source for the peak & valley
174	U_8	**DATA_SOURCE_ANALOG1**	8 bit register holds the register number of the data source for analogue O/P 1
175	U_8	**DATA_SOURCE_ANALOG2**	8 bit register holds the register number of the data source for analogue O/P 2
176	U_8	**DATA_SOURCE_TOTAL1**	8 bit register holds the register number of the data source for totalisator 1
177	U_8	**DATA_SOURCE_TOTAL2**	8 bit register holds the register number of the data source for totalisator 2
178	U_8	**DATA_SOURCE_RESULT**	8 bit register holds the register number of the data source for the result channel when code7=xx7
179	U_8	**SP1_DATA_SOURCE**	8 bit register holds the register number of the data source for setpoint 1
180	U_8	**SP2_DATA_SOURCE**	8 bit register holds the register number of the data source for setpoint 2
181	U_8	**SP3_DATA_SOURCE**	8 bit register holds the register number of the data source for setpoint 3
182	U_8	**SP4_DATA_SOURCE**	8 bit register holds the register number of the data source for setpoint 4
183	U_8	**SP5_DATA_SOURCE**	8 bit register holds the register number of the data source for setpoint 5
184	U_8	**SP6_DATA_SOURCE**	8 bit register holds the register number of the data source for setpoint 6
185	U_8	**SP1_RESET_DESTINATION**	Registers 185 – 192 are 8 bit registers which specify the destination register which will be modified by each setpoint reset function.
186	U_8	**SP2_RESET_DESTINATION**	8 bit register holds the destination register number for setpoint 2 trigger functions
187	U_8	**SP3_RESET_DESTINATION**	8 bit register holds the destination register number for setpoint 3 trigger functions
188	U_8	**SP4_RESET_DESTINATION**	8 bit register holds the destination register number for setpoint 4 trigger functions
189	U_8	**SP5_RESET_DESTINATION**	8 bit register holds the destination register number for setpoint 5 trigger functions
190	U_8	**SP6_RESET_DESTINATION**	8 bit register holds the destination register number for setpoint 6 trigger functions

Reg.	Type	Register Name	Register Description
193	U_8	**SP1_DELAY_TYPE**	Registers 193 to 198 are 8 bit registers used to control the delay type, display flashing and mode of each of the 6 setpoints. An explanation of the function of each bit is given below: Bits 0 – 2 = Delay type (xxxxx000b = Off) (xxxxx001b = normal) (xxxxx010b = one shot) (xxxxx011b = pulse) (xxxxx100b = repeat) (xxxxx101b = -ve one shot) (xxxxx110b = -ve pulse) (xxxxx111b = -ve repeat) Bit 3 = Display flash on setpoint (0 = no flash, 1 = flash on setpoint active). Bit 4,5 = Hysteresis/Deviation/PID mode (xx00xxxxb = Off) (xx01xxxxb = Hyst) (xx10xxxxb = Dev) (xx11xxxxb = PID) Bit 6 = Delay resolution (0 = 0.1Sec resolution, 1 = 1mSec resolution) Bit 7 = Reserved for future development.
194	U_8	**SP2_DELAY_TYPE**	
195	U_8	**SP3_DELAY_TYPE**	
196	U_8	**SP4_DELAY_TYPE**	
197	U_8	**SP5_DELAY_TYPE**	
198	U_8	**SP6_DELAY_TYPE**	
199	O_8	**DISPLAY_FORMAT_DEFAULT**	8 bit register holds the default display format settings (see display format mode in data sheet)
200	O_8	**DISPLAY_FORMAT_CH1**	8 bit register controls the display format settings for channel 1 (see display format mode in data sheet)
201	O_8	**DISPLAY_FORMAT_CH2**	8 bit register controls the display format settings for channel 1 (see display format mode in data sheet)
202	O_8	**DISPLAY_FORMAT_CH3**	8 bit register controls the display format settings for channel 1 (see display format mode in data sheet)
203	O_8	**DISPLAY_FORMAT_CH4**	8 bit register controls the display format settings for channel 1 (see display format mode in data sheet)
204	O_8	**DISPLAY_FORMAT_TOTAL1**	8 bit register controls the display format settings for totalisator 1 (see display format mode in data sheet)
205	O_8	**DISPLAY_FORMAT_TOTAL2**	8 bit register controls the display format settings for totalisator 2 (see display format mode in data sheet)
206	U_8	**TEXT_CHARACTER_DEFAULT**	8 bit register holds the ASCII value for the default last digit text character(0= no character)
207	U_8	**TEXT_CHARACTER_CH1**	8 bit register holds the ASCII value for the last digit text character for channel 1 (0= no character)
208	U_8	**TEXT_CHARACTER_CH2**	8 bit register holds the ASCII value for the last digit text character for channel 2 (0= no character)
209	U_8	**TEXT_CHARACTER_CH3**	8 bit register holds the ASCII value for the last digit text character for channel 3 (0= no character)
210	U_8	**TEXT_CHARACTER_CH4**	8 bit register holds the ASCII value for the last digit text character for channel 4 (0= no character)
211	U_8	**TEXT_CHARACTER_TOTAL1**	8 bit register holds the ASCII value for the last digit text character for totalisator 1 (0= no character)
212	U_8	**TEXT_CHARACTER_TOTAL2**	8 bit register holds the ASCII value for the last digit text character for totalisator 2 (0= no character)
213	U_8	**SECONDS**	8 bit register holds the real time clock seconds count(range 0-59)
214	U_8	**MINUTES**	8 bit register holds the real time clock minutes count(range 0-59)
215	U_8	**HOURS**	8 bit register holds the real time clock hours count(range 0-23)
216	U_8	**DAYS**	8 bit register holds the real time clock days of the week(Sun=1 Sat=7)
217	U_8	**DATE**	8 bit register holds the real time clock date(range 1-31)
218	U_8	**MONTH**	8 bit register holds the real time clock month(range 1-12)

Reg.	Type	Register Name	Register Description
219	U_8	**YEAR**	8 bit registers holds the real time clock year(range 0-99)
220	U_8	**BAR_ZERO**	8 bit register controls the bar zero position on the bar (range 0-100)
220	U_8	**LIGHT_BAR**	8 bit register shows/controls the status of the light bars (light bar meters only)
220	B_0	**LIGHT_BAR1**	flag shows/controls the status of light bar 1 (light bar meters only)
220	B_1	**LIGHT_BAR2**	flag shows/controls the status of light bar 2 (light bar meters only)
220	B_2	**LIGHT_BAR3**	flag shows/controls the status of light bar 3 (light bar meters only)
220	B_3	**LIGHT_BAR4**	flag shows/controls the status of light bar 4 (light bar meters only)
220	B_4	**LIGHT_BAR5**	flag shows/controls the status of light bar 5 (light bar meters only)
220	B_5	**LIGHT_BAR6**	flag shows/controls the status of light bar 6 (light bar meters only)
220	B_7	**LIGHT_REMOTE**	bit sets remote or meter control of the light bars (On=remote, light bar meters only)
221	U_8	**SETPOINT_LATCH_FLAGS**	This is an 8 bit register which controls the latching feature for the setpoints. If latching is selected for a setpoint and the appropriate bit of register 221 is set, then the setpoint will be latched (either above or below the setpoint value as selected). The setpoint can be unlatched by clearing the appropriate bit to zero. This holds true regardless of whether the latching is in the on state or the off state. Unlatching the meter from the front panel buttons or from the lock or hold pin does exactly the same thing. Setpoint Latch Mask Bit 0 = Setpoint 1 (0 = setpoint unlatched, 1 = setpoint latched) Bit 1 = Setpoint 2 (0 = setpoint unlatched, 1 = setpoint latched) Bit 2 = Setpoint 3 (0 = setpoint unlatched, 1 = setpoint latched) Bit 3 = Setpoint 4 (0 = setpoint unlatched, 1 = setpoint latched) Bit 4 = Setpoint 5 (0 = setpoint unlatched, 1 = setpoint latched) Bit 5 = Setpoint 6 (0 = setpoint unlatched, 1 = setpoint latched) Bit 6 = Don't care Bit 7 = Don't care
221	B_0	**SP1_LATCH**	
221	B_1	**SP2_LATCH**	
221	B_2	**SP3_LATCH**	
221	B_3	**SP4_LATCH**	
221	B_4	**SP5_LATCH**	
221	B_5	**SP6_LATCH**	
222	U_8	**RELAY_DE_ENERGISE_FLAGS**	This is an 8 bit register which controls the de-energising feature for the relays. Register 222 functions as follows. If the de-energise feature is selected for a setpoint, then whenever that setpoint is in it's in-active state, the appropriate bit of register 222 will be set by the software. When the setpoint becomes active, register 222 is used as a mask and the appropriate bit is ANDed with the relay output state. If the result is a "1", then the relay is energised. If the appropriate bit of register 222 is cleared to a "0" (while the setpoint is active), the relay will be de-energised. As soon as the setpoint returns to it's in-active state the appropriate bit of register 222 will be set to a "1" again. If a relay is de-energised via the front panel buttons, register 222 is modified in the same way. The function of each bit is shown below Relay De-energise Mask Bit 0 = Relay 1 Bit 1 = Relay 2 Bit 2 = Relay 3 Bit 3 = Relay 4 Bit 4 = Relay 5 Bit 5 = Relay 6 Bit 6 = Don't care Bit 7 = Don't care
222	B_0	**RLY1_DE_ENERGISE**	
222	B_1	**RLY2_DE_ENERGISE**	
222	B_2	**RLY3_DE_ENERGISE**	
222	B_3	**RLY4_DE_ENERGISE**	
222	B_4	**RLY5_DE_ENERGISE**	
222	B_5	**RLY6_DE_ENERGISE**	

Reg.	Type	Register Name	Register Description
223	U_8_R	**EEPROM_MEMORY_SIZE**	This is an 8 bit read only register which shows how much EEPROM memory is installed in the meter. The size of the EEPROM memory installed in the meter is tested by the meter when the memory is re-initialised and the result is stored in register 223. The results can be interpreted as follows: Register 223 Value EEPROM Memory Size 0 Error – the meter cannot access any EEPROM memory device 1 24C04 EEPROM installed 2 Error – not a valid EEPROM type 4 Error – not a valid EEPROM type 8 24C32 EEPROM installed 16 24C64 EEPROM installed 32 24C128 EEPROM installed 64 24C256 EEPROM installed 128 24C512 EEPROM installed Any value other than those shown above is not a valid EEPROM size and is an error.
224	U_8_R	**SETPOINT_STATUS_FLAGS**	8 bit read only register shows the status of the setpoints
224	B_0_R	**SP1_STATUS**	read only flag shows the status of setpoint 1 in normal & remote mode
224	B_1_R	**SP2_STATUS**	read only flag shows the status of setpoint 2 in normal & remote mode
224	B_2_R	**SP3_STATUS**	read only flag shows the status of setpoint 3 in normal & remote mode
224	B_3_R	**SP4_STATUS**	read only flag shows the status of setpoint 4 in normal & remote mode
224	B_4_R	**SP5_STATUS**	read only flag shows the status of setpoint 5 in normal & remote mode
224	B_5_R	**SP6_STATUS**	read only flag shows the status of setpoint 1 in normal & remote mode
225	O_8	**DISPLAY_FORMAT_RESULT**	8 bit register controls the display format settings for the result (see display format mode in data sheet)
226	U_8	**TEXT_CHARACTER_RESULT**	8 bit register holds the ASCII value for the last digit text character for the result (0= no character)
227	S_16	**AUTO_ZERO_RESULT**	16 bit register contains the auto zero correction offset for the result
228	S_16	**AUTO_ZERO_CH1**	16 bit register. auto zero correction offset for channel 1
229	S_16	**AUTO_ZERO_CH2**	16 bit register. auto zero correction offset for channel 2
230	S_16	**AUTO_ZERO_CH3**	16 bit register. auto zero correction offset for channel 3
231	S_16	**AUTO_ZERO_CH4**	16 bit register. auto zero correction offset for channel 4
232	U_16	**STATE**	16 bit register. Used to control the state number of the macro (cleared to 0 when returning to operational display)
233	U_8_R	**TRIGGER_STATUS**	Register 233 is a single 8 bit read only register which contains 6 flags showing the trigger status for each of the 6 setpoint trigger functions. Each flag is set if the trigger condition selected for that setpoint (i.e. make, break, both, level) is satisfied, and cleared if the trigger condition is false. The function of each bit is shown below. Setpoint Trigger Flags Bit 0 = Setpoint 1 trigger flag (0 = trigger in-active, 1 = trigger activated) Bit 1 = Setpoint 2 trigger flag (0 = trigger in-active, 1 = trigger activated) Bit 2 = Setpoint 3 trigger flag (0 = trigger in-active, 1 = trigger activated) Bit 3 = Setpoint 4 trigger flag (0 = trigger in-active, 1 = trigger activated) Bit 4 = Setpoint 5 trigger flag (0 = trigger in-active, 1 = trigger activated) Bit 5 = Setpoint 6 trigger flag (0 = trigger in-active, 1 = trigger activated) Bit 6 = Don't care Bit 7 = Don't care
233	B_0_R	**TRIGGER1**	
233	B_1_R	**TRIGGER2**	
233	B_2_R	**TRIGGER3**	
233	B_3_R	**TRIGGER4**	
233	B_4_R	**TRIGGER5**	
233	B_5_R	**TRIGGER6**	
237	S_32	**AUX8**	32 bit auxiliary result register 8 for user defined use
238	S_32	**AUX7**	32 bit auxiliary result register 7 for user defined use
239	S_32	**AUX6**	32 bit auxiliary result register 6 for user defined use
240	S_32	**AUX5**	32 bit auxiliary result register 5 for user defined use

Reg.	Type	Register Name	Register Description
241	S_32	**AUX4**	32 bit auxiliary result register 4 for user defined use
242	S_32	**AUX3**	32 bit auxiliary result register 3 for user defined use
243	S_32	**AUX2**	32 bit auxiliary result register 2 for user defined use
244	S_32	**AUX1**	32 bit auxiliary result register 1 for user defined use
250	S_32	**CH4**	32 bit register holds the processed data for channel 4.
251	S_32	**CH3**	32 bit register holds the processed data for channel 3.
252	S_32	**CH2**	32 bit register holds the processed data for channel 2.
253	S_32	**CH1**	32 bit register holds the processed data for channel 1.
254	S_32	**RESULT**	32 bit register holds the processed data for the result channel. The above registers are normally updated by the operating system of the controller after a new input sample is processed. If the channel is disabled or in a counter mode, it is also possible to modify the contents of the register by writing to it from the setpoint reset logic, the Macro or via the serial port. A write to these registers in any other operational mode may result in the newly written value being over written by the operating system in the controller. A write to the CHx_PROCESSED, CHx_RAW, or CHx_SCALED registers will modify only that register. A write to the CHx register will automatically update CHx_PROCESSED, CHx_RAW, and CHx_SCALED. The controller will take into account scale and offset and post processing and calulate the CHx_RAW value. (This is useful to reset the count in counter applications which use a scale and offset value other than 1 and 0). Note: 32 point linearization is not supported by the above feature. A read of CHx register is identical to a read of CHx_PROCESSED register."
257	S_24	**TABLE1_INPUT1**	24 bit registers. Input points 1 to 32, 32 point linearisation table 1 (range -8388607 - +8388607).
to		**to**	
288	S_24	**TABLE1_INPUT32**	
289	S_24	**TABLE1_OUTPUT1**	24 bit registers. Output points 1 to 32, 32 point linearisation table 1 (range -8388607 - +8388607).
to		**to**	
320	S_24	**TABLE1_OUTPUT32**	
321	S_24	**TABLE2_INPUT1**	24 bit registers. Input points 1 to 32, 32 point linearisation table 2 (range -8388607 - +8388607).
to		**to**	
352	S_24	**TABLE2_INPUT32**	
353	S_24	**TABLE2_OUTPUT1**	24 bit registers. Output points 1 to 32, 32 point linearisation table 2 (range -8388607 - +8388607).
to		**to**	
384	S_24	**TABLE2_OUTPUT32**	
385	S_24	**TABLE3_INPUT1**	24 bit registers. Input points 1 to 32, 32 point linearisation table 3 (range -8388607 - +8388607).
to		**to**	
416	S_24	**TABLE3_INPUT32**	
417	S_24	**TABLE3_OUTPUT1**	24 bit registers. Output points 1 to 32, 32 point linearisation table 3 (range -8388607 - +8388607).
to		**to**	
448	S_24	**TABLE3_OUTPUT32**	
449	S_24	**TABLE4_INPUT1**	24 bit registers. Input points 1 to 32, 32 point linearisation table 4 (range -8388607 - +8388607).
to		**to**	
480	S_24	**TABLE4_INPUT32**	

Reg.	Type	Register Name	Register Description
481	S_24	**TABLE4_OUTPUT1**	24 bit registers. Output points 1 to 32, 32 point linearisation table 4 (range -8388607 - +8388607).
to		**to**	
512	S_24	**TABLE4_OUTPUT32**	
705	U_16	**CODE_BLANKING**	Register 705 is a 16 bit register in EEPROM which controls the sequence of code setups that are displayed when the “Prog” and “Up” button are pressed. Each bit in the register controls a specific code display as shown below. If a specific bit is a “0” then the display of the associated function is disabled and that function will be skipped over. If a bit is a “1” the function will be displayed. Bit 0 = not used Bit 1 = Brightness Bit 2 = “Lock” display Bit 3 = Cal Bit 4 = Code 1 Bit 5 = Code 2 Bit 6 = Code 3 Bit 7 = Code 4 Bit 8 = Code 5 Bit 9 = Code 6 Bit 10 = Code 7 Bit 11 = Code 8 Bit 12 = Code 9 Bit 13 = Code 10 Bit 14 = not used Bit 15 = not used The default value will be 65535 (0xFFFF hex) which is all codes enabled.
706	U_16	**SETPOINT_BLANKING**	Register 706 is a 16 bit register in EEPROM which controls the sequence of code setups that are displayed when the “Prog” and “Down” button are pressed. Each bit in the register functions in the same manner as above for register 705 but with the different control functions as shown below. Bit 0 = “Lock” display Bit 1 = Setpoint 1 Bit 2 = Setpoint 2 Bit 3 = Setpoint 3 Bit 4 = Setpoint 4 Bit 5 = Setpoint 5 Bit 6 = Setpoint 6 Bit 7 = Setpoint control 1 Bit 8 = Setpoint control 2 Bit 9 = Setpoint control 3 Bit 10 = Setpoint control 4 Bit 11 = Setpoint control 5 Bit 12 = Setpoint control 6 Bit 13 = not used Bit 14 = not used Bit 15 = not used The default value will be 8191 (0x1FFF hex) which is all codes enabled.

Reg.	Type	Register Name	Register Description
707	U_16	**VIEW_MODE_BLANKING**	Register 707 is a 16 bit register in EEPROM which controls the sequence of displays which can be viewed when the “Up” or “Down” buttons are pressed. Each bit in the register functions in the same manner as for register 705 above but with the different control functions as shown below. Down Button: Bit 0 = Setpoint 2 Bit 1 = Setpoint 4 Bit 2 = Setpoint 6 Bit 3 = Valley Bit 4 = Total 2 Bit 5 = Channel 2 Bit 6 = Channel 4 Bit 7 = Enable view mode macro on Down button Up Button: Bit 8 = Setpoint 1 Bit 9 = Setpoint 3 Bit 10 = Setpoint 5 Bit 11 = Peak Bit 12 = Total 1 Bit 13 = Channel 1 Bit 14 = Channel 3 Bit 15 = Enable view mode macro on Up button The default value will be 32639 (0x7F7F hex) which is all codes enabled except the view macro.
708	S_32	**INC_DEC_DISPLAY**	32 bit register. Permanent memory storage for display value in on demand manual loader mode
709	S_32	**SPAN**	32 bit register. Span value for single/dual point calibration mode
710	S_32	**ZERO**	32 bit register. Zero value for single/dual point calibration mode
711	U_16	**TABLE1_DATE**	16 bit register. Date (Year/Week) when linearisation table 1 was last modified(range 0000 - 9952)
712	U_16	**TABLE2_DATE**	16 bit register. Date (Year/Week) when linearisation table 2 was last modified(range 0000 - 9952)
713	U_16	**TABLE3_DATE**	16 bit register. Date (Year/Week) when linearisation table 3 was last modified(range 0000 - 9952)
714	U_16	**TABLE4_DATE**	16 bit register. Date (Year/Week) when linearisation table 4 was last modified(range 0000 - 9952)
715	U_16	**TABLE1_SERIAL_NO**	16 bit register. Serial number of linearisation table 1 (range 0-65535)
716	U_16	**TABLE2_SERIAL_NO**	16 bit register. Serial number of linearisation table 2 (range 0-65535)
717	U_16	**TABLE3_SERIAL_NO**	16 bit register. Serial number of linearisation table 3 (range 0-65535)
718	U_16	**TABLE4_SERIAL_NO**	16 bit register. Serial number of linearisation table 4 (range 0-65535)
719	S_32	**MANUAL_LOADER_DISPLAY**	32 bit register. Permanent memory storage for display value in direct display manual loader mode

Reg.	Type	Register Name	Register Description
720	U_16	**LOG_WRITE_POINTER**	Register 720 is a 16-bit register that points to the most recent log sample written by the meter. It counts up from 0 each time a new sample is logged, with the maximum number of samples being limited by the size of non-volatile memory installed in the controller and also the number/size of registers to be logged. Before a new sample is written, the controller first checks to make sure that it is not overwriting a sample that has not been read. It does this by comparing the write pointer with the read pointer. If they are the same and the Linear logging mode has been selected, data logging is halted until a read is actioned. If this occurs, any new samples will be lost. If the Cyclic mode has been selected, the oldest sample will be overwritten with new data and the old sample will be lost. When the sample number reaches the maximum count it wraps around to zero. Register 720 can be read from or written to. Make sure that any values written to this pointer are within the allowable range for the size of the installed memory.
721	U_16	**LOG_READ_POINTER**	Register 721 is a 16-bit register that points to the most recent log sample read from the controller. It counts up from 0 each time log data is read from the controller, with the maximum number of samples being limited by the size of non-volatile memory installed in the controller and also the number/size of registers to be logged. When it reaches the maximum count it wraps around to zero. When it reaches the write pointer the log buffer is empty and no more data can be read out of the log. Register 721 can be read from or written to. Make sure that any values written to this pointer are within the allowable range for the size of the installed memory.
722	U_8_W	**SINGLE_LOG**	Register 722 is used to read the next sample of log data. It does this by comparing the log read pointer (reg 721) with the log write pointer (reg 720). If they are equal then there has been no new samples logged since the last read and the message “No New Log Data” is sent as a response. If they are not equal, the log read pointer (reg 721) is incremented to point to the new sample, and the new log data is transmitted. Registers 720 & 721 can be used to control the data logger. To reset the data logger, both 720 & 721 should be set to 0 (or any other value in the allowable range of memory). A write to register 722 will cause a new log sample to be taken. The value written to the register will be ignored and registers 723 – 726 will be logged as normal. This allows a log sample to be taken on demand via the serial port or from the control of the macro. Data logging must be enabled in Code 8 for this feature to function. Note: Register 722 can only be read via the serial port in ASCII mode. To read log data in other serial modes or from the macro, see registers 781 to 791.
723	U_16	**LOG_REG1**	Registers 723 - 726 are used to specify which registers the data logger logs. Register 723 specifies the first register to be logged, 724 the second, 725 the third and 726 the fourth. The exact number of registers logged by the data logger will depend on the setting of code 8. If a full time stamp (i.e. date & time) is selected, then only the two registers specified by 723 & 724 will be logged. If only the time is selected in code 8 then the registers specified by 723, 724, & 725 will be logged. If no date or time stamp is selected then the registers specified by 723, 724, 725, & 726 will logged. Registers 723 - 726 can be read and written as normal registers. Only register numbers 1 - 256 can be used by the data logger so registers 723 - 726 must contain a value within this range. Any values over 256 will produce incorrect results.
724	U_16	**LOG_REG2**	
725	U_16	**LOG_REG3**	
726	U_16	**LOG_REG4**	

Reg.	Type	Register Name	Register Description
727		-	Register 727 is a read only register similar to register 722 above except that it is used to read multiple log samples with a single command. A read of register 727 will output log data, starting at the sample pointed to by the read pointer, and continue to output log samples up to the latest sample, pointed to by the write pointer. Each time it outputs a log sample the read pointer is automatically incremented. At the end of the sequence, the read pointer is equal to the write pointer. This command can also be used to read a selected block of log samples by modifying the read pointer (reg 721) and the write pointer (reg 720) prior to reading reg 727. Note: Register 727 can only be read via the serial port in ASCII mode. To read log data in other serial modes or from the macro, see registers 781 to 791.
730	F_32	**SMART_CAL1**	Registers 730 to 733 are 32 bit floating point registers, used to store calibration values for smart input modules. Reading or writing these registers will directly access the data in the smart input module itself. A write will write to the smart input module and then backup the data in EEPROM so that it can be sent to the smart input module at power up. The actual function of each register will vary depending on which smart input module is being used. Some smart input modules do not use these registers and any attempt to access them will produce a null response. If there are no smart input modules operating, these registers cannot be read. A write to these registers will always update the EEPROM, regardless of whether an appropriate smart input module is operational at the time.
731	F_32	**SMART_CAL2**	
732	F_32	**SMART_CAL3**	
733	F_32	**SMART_CAL4**	
734	U_8	**AZ_CAPTURE_BAND_RESULT**	8 bit register. Auto zero capture band for result (range 0-254 counts,255=manual zero)
735	U_8	**AZ_CAPTURE_BAND_CH1**	8 bit register. Auto zero capture band for channel 1 (range 0-254 counts,255=manual zero)
736	U_8	**AZ_CAPTURE_BAND_CH2**	8 bit register. Auto zero capture band for channel 2 (range 0-254 counts,255=manual zero)
737	U_8	**AZ_CAPTURE_BAND_CH3**	8 bit register. Auto zero capture band for channel 3 (range 0-254 counts,255=manual zero)
738	U_8	**AZ_CAPTURE_BAND_CH4**	8 bit register. Auto zero capture band for channel 4 (range 0-254 counts,255=manual zero)
739	U_8	**AZ_MOTION_BAND_RESULT**	8 bit register. Auto zero motion band for result (range 0-255 counts/second).
740	U_8	**AZ_MOTION_BAND_CH1**	8 bit register. Auto zero motion band for channel 1 (range 0-255 counts/second).
741	U_8	**AZ_MOTION_BAND_CH2**	8 bit register. Auto zero motion band for channel 2 (range 0-255 counts/second).
742	U_8	**AZ_MOTION_BAND_CH3**	8 bit register. Auto zero motion band for channel 3 (range 0-255 counts/second).
743	U_8	**AZ_MOTION_BAND_CH4**	8 bit register. Auto zero motion band for channel 4 (range 0-255 counts/second).
744	U_16	**AVERAGING_WINDOW_RESULT**	16 bit register. Averaging window for result (range 0-65535 counts).
745	U_16	**AVERAGING_WINDOW_CH1**	16 bit register. Averaging window for channel 1 (range 0-65535 counts).
746	U_16	**AVERAGING_WINDOW_CH2**	16 bit register. Averaging window for channel 2 (range 0-65535 counts).
747	U_16	**AVERAGING_WINDOW_CH3**	16 bit register. Averaging window for channel 3 (range 0-65535 counts).
748	U_16	**AVERAGING_WINDOW_CH4**	16 bit register. Averaging window for channel 4 (range 0-65535 counts).
749	U_8	**AVERAGING_SAMPLES_RESULT**	8 bit register. Averaging samples for result (range 0-255 samples).
750	U_8	**AVERAGING_SAMPLES_CH1**	8 bit register. Averaging samples for channel 1 (range 0-255 samples).
751	U_8	**AVERAGING_SAMPLES_CH2**	8 bit register. Averaging samples for channel 2 (range 0-255 samples).
752	U_8	**AVERAGING_SAMPLES_CH3**	8 bit register. Averaging samples for channel 3 (range 0-255 samples).
753	U_8	**AVERAGING_SAMPLES_CH4**	8 bit register. Averaging samples for channel 4 (range 0-255 samples).

Reg.	Type	Register Name	Register Description
754	U_16	**PID1_ANTI_RESET_WINDUP**	16 bit register. PID anti reset windup for setpoint 1. % of PB (range 0.1% - 100.0%). Registers 754 – 757 are only accessible if PID software is included. Some models of meter may not include PID control functions.
755	U_16	**PID2_ANTI_RESET_WINDUP**	16 bit register. PID anti reset windup for setpoint 2. % of PB (range 0.1% - 100.0%).
756	U_16	**PID1_CYCLE_TIME**	16 bit register. PID cycle time for setpoint 1 (range 0-1000.0 seconds).
757	U_16	**PID2_CYCLE_TIME**	16 bit register. PID cycle time for setpoint 2 (range 0-1000.0 seconds).
758	O_8	**SMART_SETUP1**	8 bit register. Setup 1 data for smart input module.
759	O_8	**SMART_SETUP2**	8 bit register. Setup 2 data for smart input module.
760	O_8	**SMART_SETUP3**	8 bit register. Setup 3 data for smart input module.
761	S_32	**K_FACTOR1**	32 bit register. K factor for totalisator 1.
762	S_32	**K_FACTOR2**	32 bit register. K factor for totalisator 2.
763	S_16	**CUTOFF1**	16 bit register. Cutoff value for totalisator 1 (range -32768 to 32767).
764	S_16	**CUTOFF2**	16 bit register. Cutoff value for totalisator 2 (range -32768 to 32767).
765	__R	**SMART_ID**	8 bit read only register. Defines the type of smart input module currently in use.
766	U_16	**AZ_APERTURE_BAND_RESULT**	16 bit register. Auto zero aperture band for result (range 0-65535 counts).
767	U_16	**AZ_APERTURE_BAND_CH1**	16 bit register. Auto zero aperture band for channel 1 (range 0-65535 counts).
768	U_16	**AZ_APERTURE_BAND_CH2**	16 bit register. Auto zero aperture band for channel 2 (range 0-65535 counts).
769	U_16	**AZ_APERTURE_BAND_CH3**	16 bit register. Auto zero aperture band for channel 3 (range 0-65535 counts).
770	U_16	**AZ_APERTURE_BAND_CH4**	16 bit register. Auto zero aperture band for channel 4 (range 0-65535 counts).
771	S_32	**EDIT_MAX**	32 bit register. Sets the maximum allowable range in edit mode.
772	S_32	**EDIT_MIN**	32 bit register. Sets the minimum allowable range in edit mode.
773	S_32	**EDIT_DEF**	32 bit register. Sets the default value when Up&Down buttons are pressed in edit mode.

Reg.	Type	Register Name	Register Description
774	U_8	**EDIT_STATE**	8 bit register. Defines which parameter type is currently being edited. Register 774 is an 8 bit register which gives the current operational state of meter when it is in any edit mode. The following table shows the different parameters that are being edited in each state.

Edit State	Operation
0	Not in edit mode
1	Brightness
2	Lock display (up)
3	Cal
4	Code 1
5	Code 2
6	Code 3
7	Code 4
8	Code 5
9	Code 6
10	Code 7
11	Code 8
12	Code 9
13	Code 10
14	Not used
15	Edit mode - Macro
16	Lock display (down)
17	Set-point 1
18	Set-point 2
19	Set-point 3
20	Set-point 4
21	Set-point 5
22	Set-point 6
23	Set-point 1 control
24	Set-point 2 control
25	Set-point 3 control
26	Set-point 4 control
27	Set-point 5 control
28	Set-point 6 control
29 – 31	Not used
32	Manual cal - offset
33	Manual cal - scale
34	Tbuff in PH mode or Cal TC, RTD
35	Auto cal - Zero
36	Auto cal - Span
37	Auto cal - 4 sec delay and calculate scale & offset values
38	Baud rate
39	Parity
40	Transmit delay
41	Serial address
42	Analog o/p – cal low end
43	Analog o/p – cal high end
44	Analog o/p – zero
45	Analog o/p – full scale
46	K factor for totalisator
47	Cut off for totalisator
48	Prescaler for counter 1
49	Display format
50	Display Text character
51	Inc/dec, Manual loader mode from Prog button
52	Bar low
53	Bar high
54	Bar nominal
55	Colour band 1
56	Colour band 2
57	Colour band 3
58	Colour band 4
59	Colour band 5
60	Colour band 6
61	Colour band 7
62	Prescaler for counter 2
63	Calibrate zero in Ph mode
64	Calibrate span in Ph mode

Edit State	Operation
65	Display source
66 – 68	Not used
69	Auto zero capture band
70	Auto zero motion band
71	Averaging samples
72	Averaging window
73	Smart input module Setup 1
74	Smart input module Setup 2
75	Smart input module Setup 3
76	Auto zero aperture band
77	Display input value for totalisator setup
78	Totalisator rate time selection
79	Totalisator roll over select
80	Select 7 or 8 data bits for serial port
81	Disable code blanking
96	Select mode for 32 point lin
97	Select table for 32 point lin
98	Enter date for 32 point lin
99	Enter serial no. for 32 point lin
100-163	Edit 32 point input and output values. Even numbers = input values, odd numbers = output values.

Reg.	Type	Register Name	Register Description
775	U_8	**SP1_TRIGGER**	Registers 775 – 780 are 8 bit registers used for selecting the setpoint trigger functions. The function of each bit is shown below; Bits 0 – 2 = Trigger Functions (xxxxx000b = All trigger functions disabled) (xxxxx001b = Trigger on make edge) (xxxxx010b = Trigger on break edge) (xxxxx011b = Trigger on both make & break edge) (xxxxx100b = Trigger when energised) Bits 3 & 4 = Reset Mode (xxx00xxxb = Destination register = user defined constant) (xxx01xxxb = Destination register = Input_data - Setpoint_value+Constant) (xxx10xxxb = Destination register = Destination + Constant) (xxx11xxxb = Destination register = Source register) Bit 5 = Reserved for future development Bit 6 = Log on selected edge (0 = no log, 1 = log). Bit 7 = Print on selected edge (0 = no print, 1 = print).
776	U_8	**SP2_TRIGGER**	
777	U_8	**SP3_TRIGGER**	
778	U_8	**SP4_TRIGGER**	
779	U_8	**SP5_TRIGGER**	
780	U_8	**SP6_TRIGGER**	
781	U_8_R	**LOG_SAMPLE_TRIGGER**	This register gives an 8 bit numeric value which defines the trigger point for the sample. 0 = Triggered by reset 1 = Triggered by set-point 1 2 = Triggered by set-point 2 3 = Triggered by set-point 3 4 = Triggered by set-point 4 5 = Triggered by set-point 5 6 = Triggered by set-point 6 7 - 16 = Reserved for future development. 17 = Triggered by Program button. 18 = Triggered by F1 button. 19 = Triggered by F2 button. 20 = Triggered by Hold pin. 21 = Triggered by Lock pin. 22 - 23 = Reserved for future development. 24 = Triggered by a write to register 722 (either via the serial port or macro). Registers 781 – 791 are read only registers used to access data from a log sample. A read of one of these registers, will read the appropriate data from the log sample which is addressed by the current value of the log read pointer (reg #721). . A read of one of these registers will not modify the log read or the log write pointer. The user must setup up the log read pointer to the required sample number before accessing registers 781 – 791. In each case, the output will be a numeric value only. These registers can be read in ASCII or Modbus modes, and can also be read from the macro. (For a text output, the registers 722 & 727 should be used in ASCII or print mode).
782	U_8_R	**LOG_SAMPLE_DATE**	Read only register. Returns 8 bit value for date of current log sample (range 1-31 days).
783	U_8_R	**LOG_SAMPLE_MONTH**	Read only register. Returns 8 bit value for month of current log sample (range 1-12 months).
784	U_8_R	**LOG_SAMPLE_YEAR**	Read only register. Returns 8 bit value for year of current log sample (range 00-99 years).
785	U_8_R	**LOG_SAMPLE_HOUR**	Read only register. Returns 8 bit value for hours in current log sample (range 0-23 hours).
786	U_8_R	**LOG_SAMPLE_MINUTE**	Read only register. Returns 8 bit value for minutes in current log sample (range 0-59 minutes).
787	U_8_R	**LOG_SAMPLE_SECOND**	Read only register. Returns 8 bit value for seconds in current log sample (range 0-59 seconds).
788	U_8_R	**LOG_SAMPLE_REG1**	Read only register. Returns 1st data value for logged in current log sample (range depends on size of 1st reg).
789	U_8_R	**LOG_SAMPLE_REG2**	Read only register. Returns 2nd data value for logged in current log sample (range depends on size of 2nd reg).

Reg.	Type	Register Name	Register Description
790	U_8_R	**LOG_SAMPLE_REG3**	Read only register. Returns 3rd data value for logged in current log sample (range depends on size of 3rd reg).
791	U_8_R	**LOG_SAMPLE_REG4**	Read only register. Returns 4th data value for logged in current log sample (range depends on size of 4th reg).
801	U_8	**STRING_CHARACTER**	The protocol for master mode is not set in software. Instead it can be user defined in the macro. Registers 801/802 are used for this purpose. Register 801 is an 8 bit register which has 2 functions, depending on the value of register 802. If register 802 is zero, (i.e. string length = zero), then register 801 functions as an end of string character (EOS) for master mode serial comms, allowing the user to define their own terminating character for the received string. If register 802 has some value other than zero, then register 801 functions as a start of string character. In this mode the serial port will look for the start character and then input the number of bytes defined in register 802. Because this mode is only for use with the macro, this register is only available on T meters.
802	U_8	**STRING_LENGTH**	Register 802 is an 8 bit register which sets the string length for the receive port in master serial mode. If this register is greater than zero, the serial port will search for the start character defined in register 801, and then it will input the specified number of bytes. Because this mode is only for use with the macro, this register is only available on T meters.
803	U_8	**RATE_TOTALIZER1**	Registers 803 & 804 are 8 bit registers which control the time period for K factor calculation and roll over features for Totalisators 1 & 2 respectively. The format of these registers is shown below. Bits 0 – 3 xxxx0000 = 1 second period for K factor calculations xxxx0001 = 10 seconds period for K factor calculations xxxx0010 = 1 minute period for K factor calculations xxxx0011 = 10 minute period for K factor calculations xxxx0100 = 1 hour period for K factor calculations xxxx0101 = 10 hours period for K factor calculations xxxx0110 = 1 day period for K factor calculations xxxx0111 = 1 week period for K factor calculations Bit 4 = Totalisator Roll over (0 = inactive, 1 = roll over active) Bit 5-7 = unused at present.
804	U_8	**RATE_TOTALIZER2**	
805	F_32	**VARIABLE_A_FP**	Registers 805 & 806 both address the same physical 32 bit register in memory (Variable A), but differ in the way the register is interpreted. Accessing Variable A through register 805 will assume the contents have been stored in a floating point format. Accessing variable A through register 806 will assume the contents have been stored in a fixed point format. This pair of registers is only intended for use with the macro.
806	S_32	**VARIABLE_A_INT**	
807	U_8	**RECEIVE_FLAGS**	8 bit register. Serial receive flags. Used in master mode.
807	B_0	**RECEIVE_READY**	This flag shows that a new message string has been received in master mode.
808	U_32	**DIGITAL_OUT**	Register 808 is a 32 bit register which contains bit flags to control up to 32 digital outputs. It is designed to be used with a macro and requires one or more IO expansion modules to be fitted to the meter. The bit functions are as follows; Bit 0 = Output DO_1 (1 = active state), 0 = inactive state) Bit 1 = Output DO_2 (1 = active state), 0 = inactive state) Bit 2 = Output DO_3 (1 = active state), 0 = inactive state) | | | Bit 31 = Output DO_32 (1 = active state), 0 = inactive state) Note: Because these extra digital outputs are only used by the macro, this register is only available on T meters and must be used with a hardware I/O expansion module.
808	B_0	**DO_1**	
to		**to**	
808	B_31	**DO_32**	

Reg.	Type	Register Name	Register Description
809 809 to 809	U_32_R B_0_R B_31_R	**DIGITAL_IN** **DI_1** **to** **DI_32**	Register 809 is a 32 bit register which contains bit flags to read up to 32 digital inputs. It is designed to be used with a macro and requires one or more IO expansion modules to be fitted to the meter. The bit functions are as follows; Bit 0 = Input DI_1 (1 = active state), 0 = inactive state) Bit 1 = Input DI_2 ((1 = active state), 0 = inactive state) Bit 2 = Input DI_3 ((1 = active state), 0 = inactive state) | | | Bit 31 = Input DI_32 ((1 = active state), 0 = inactive state) Note: Because these extra digital inputs are only used by the macro, this register is only available on T meters and must be used with a hardware I/O expansion module.
810	U_8_R	**IO_TYPE**	Register 810 is an 8 bit unsigned register that shows which I/O expansion module is connected to the meter at switch on. This will contain one of the following values; **Data Value** — **Function** 0 — No I/O expansion module fitted 1 — 4 setpoints for bar graph output 2 — 6 setpoints, 10 digital outputs (DO_1 - DO_10),6 digital inputs (DI_1 - DI_6) 4 — 16 digital outputs (DO_1 - DO_16) 8 — 16 digital inputs (DI_1 - DI_16) 16 — 6 setpoints, 6 digital outputs (DO_1 - DO_6),10 digital inputs (DI_1 - DI_10) 32 — Not used 64 — 16 digital outputs (DO_17 - DO_32) 128 — 16 digital inputs (DI_17 - DI_32) Note: This register is updated by the meter at power up, or if a different module type is detected. If the I/O expansion module is removed after power up, this register will retain it's original value and keep trying to locate the I/O module on the expansion bus. It will only change to a new value if another I/O module type is located on the bus. Although this is intended as a read only register, it can be written to. Writing a value of zero to this register will disable the I/O expansion module. Writing any value other than zero will force the meter to search the bus for a connected I/O module.
811 812	U_16 U_16	**INPUT_RATE1** **INPUT_RATE2**	Registers 811 & 812 are both 16 bit unsigned registers which hold the numeric value for the input rate used during the totalisator calibration proceedure.
813	U_8	**DATALOG_MEM_SIZE**	Register 813 is an 8 bit unsigned register which shows the if the extended data logger module is fitted to the meter and how much memory is installed. If the value = 0 then there is no external data logger connected to the meter. Any value other than 0 gives the amount of memory fitted in Mbytes.
814	U_8_R	**SMART_VERSION**	Register 814 is an 8 bit read only unsigned register which shows the software version number of a smart input module connected to the meter. The meter must have at least one input channel set to smart input mode before this register will be updated.
815	U_8_R	**CPU_LOADING**	This register is an 8 bit read only unsigned register which shows the current processing load on the CPU in the meter from 1 – 100%. A value over 90% indicates that the meter is running out of processing time to complete all of the required functions within the selected update time. As a result input samples or output functions may be skipped and software timers or totalisators may become inaccurate. The solution is to set to 'Off' all unused functions and setpoints, reduce the size of any macros which are currently running and lastly to select an update rate of 0.1 seconds.

Reg.	Type	Register Name	Register Description
816	U_16_R	**MACRO_SIZE**	This register is a 16 bit read only register which defines the amount of macro code space available in the meter. Reading this register will produce a number from 1 – 65535 which relates to the number of ASCII/Modbus registers allocated for macro code storage. This may change with model or version number.
1025	U_8	**RECEIVE_COUNT**	8 bit register which shows how many characters have been received by the serial port.
1026	U_8	**RECEIVE_BUFFER**	Start of serial receive buffer (99 bytes long).
5121	S_16	**USER_MEMORY_1**	16 bit non volatile memory registers for user defined data/tables, range -32768 to 32767 (100,000 writes max).
to		**to**	
6144	S_16	**USER_MEMORY_1024**	
A	L_32_T	**RegA_STRING**	Reserved - Undefined
B	L_32_T	**RegB_STRING**	Read Register 2, Write Display Text
C	L_32_T	**RegC_STRING**	Reserved - Undefined
D	L_32_T	**RegD_STRING**	Reserved - Undefined
E	L_32_T	**RegE_STRING**	Reserved - Undefined
F	L_32_T	**RegF_STRING**	Reserved - Undefined
G	L_32_T	**RegG_STRING**	Reserved - Undefined
H	L_32_T	**Peak_Text**	Text display for Peak
I	L_32_T	**Valley_Text**	Text display for Valley
J	L_32_T	**Total1_Text**	Text display for Total 1
K	L_32_T	**Total2_Text**	Text display for Total 2
L	L_32_T	**Setpoint1_Text**	Text display for Setpoint 1
M	L_32_T	**Setpoint2_Text**	Text display for Setpoint 2
N	L_32_T	**Setpoint3_Text**	Text display for Setpoint 3
O	L_32_T	**Setpoint4_Text**	Text display for Setpoint 4
P	L_32_T	**Setpoint5_Text**	Text display for Setpoint 5
Q	L_32_T	**Setpoint6_Text**	Text display for Setpoint 6
R	L_8_T	**Over_Text**	Text display for over-range
S	L_8_T	**Under_Text**	Text display for under-range
T	L_32_T	**Channel1_Text**	Text display for Channel 1
U	L_32_T	**Channel2_Text**	Text display for Channel 2
V	L_32_T	**Channel3_Text**	Text display for Channel 3
W	L_32_T	**Channel4_Text**	Text display for Channel 4
X	L_32_T	**Print_String**	Print String
Y	L_32_T	**RegY_STRING**	Reserved - Undefined
Z	L_32_T	**RegZ_STRING**	Reserved - Undefined

Notes:

Function	Register Name	Type	Reg.
Analog Output 1	ANALOG_OUTPUT1	S_16	83
	D2A_AOP1_CAL_HIGH	S_16	32
	D2A_AOP1_CAL_LOW	S_16	30
	D2A_AOP1_FULL_SCALE	S_32	36
	D2A_AOP1_ZERO	S_32	34
	DATA_SOURCE_ANALOG1	U_8	174
Analog Output 2	ANALOG_OUTPUT2	S_16	84
	D2A_AOP2_CAL_HIGH	S_16	33
	D2A_AOP2_CAL_LOW	S_16	31
	D2A_AOP2_FULL_SCALE	S_32	37
	D2A_AOP2_ZERO	S_32	35
	DATA_SOURCE_ANALOG2	U_8	175
Channel 1	CH1	S_32	253
	CH1_PROCESSED	S_32	4
	CH1_RAW	S_32	19
	CH1_SCALED	S_32	22
Channel 1 Setup	AUTO_ZERO_CH1	S_16	228
	AVERAGING_SAMPLES_CH1	U_8	750
	AVERAGING_WINDOW_CH1	U_16	745
	AZ_APERTURE_BAND_CH1	U_16	767
	AZ_CAPTURE_BAND_CH1	U_8	735
	AZ_MOTION_BAND_CH1	U_8	740
	CH1_PRESCALER	U_16	97
	CH1_PRESCALER_COUNT	S_16	45
	OFFSET_CH1	S_32	28
	SCALE_FACTOR_CH1	F_32	25
Channel 2	CH2	S_32	252
	CH2_PROCESSED	S_32	5
	CH2_RAW	S_32	20
	CH2_SCALED	S_32	23
Channel 2 Setup	AUTO_ZERO_CH2	S_16	229
	AVERAGING_SAMPLES_CH2	U_8	751
	AVERAGING_WINDOW_CH2	U_16	746
	AZ_APERTURE_BAND_CH2	U_16	768
	AZ_CAPTURE_BAND_CH2	U_8	736
	AZ_MOTION_BAND_CH2	U_8	741
	CH2_PRESCALER	U_16	98
	CH2_PRESCALER_COUNT	S_16	46
	OFFSET_CH2	S_32	29
	SCALE_FACTOR_CH2	F_32	26
Channel 3	CH3	S_32	251
	CH3_PROCESSED	S_32	39
	CH3_RAW	S_32	41
	CH3_SCALED	S_32	43
Channel 3 Setup	AUTO_ZERO_CH3	S_16	230

Function	Register Name	Type	Reg.
	AVERAGING_SAMPLES_CH3	U_8	752
	AVERAGING_WINDOW_CH3	U_16	747
	AZ_APERTURE_BAND_CH3	U_16	769
	AZ_CAPTURE_BAND_CH3	U_8	737
	AZ_MOTION_BAND_CH3	U_8	742
	OFFSET_CH3	S_32	104
	SCALE_FACTOR_CH3	F_32	102
Channel 4	CH4	S_32	250
	CH4_PROCESSED	S_32	40
	CH4_RAW	S_32	42
	CH4_SCALED	S_32	44
Channel 4 Setup	AUTO_ZERO_CH4	S_16	231
	AVERAGING_SAMPLES_CH4	U_8	753
	AVERAGING_WINDOW_CH4	U_16	748
	AZ_APERTURE_BAND_CH4	U_16	770
	AZ_CAPTURE_BAND_CH4	U_8	738
	AZ_MOTION_BAND_CH4	U_8	743
	OFFSET_CH4	S_32	105
	SCALE_FACTOR_CH4	F_32	103
Clock	DATE	U_8	217
	DAYS	U_8	216
	HOURS	U_8	215
	MINUTES	U_8	214
	MONTH	U_8	218
	SECONDS	U_8	213
	YEAR	U_8	219
Codes	CAL	O_8	129
	CODE1	O_8	130
	CODE2	O_8	131
	CODE3	O_8	132
	CODE4	O_8	133
	CODE5	O_8	134
	CODE6	O_8	135
	CODE7	O_8	136
	CODE8	O_8	137
	CODE9	O_8	138
	CODE10	O_8	139
Data Logging	LOG_READ_POINTER	U_16	721
	LOG_REG1	U_16	723
	LOG_REG2	U_16	724
	LOG_REG3	U_16	725
	LOG_REG4	U_16	726
	LOG_WRITE_POINTER	U_16	720
	SINGLE_LOG	U_8_W	722
Data Logging Read Only	LOG_SAMPLE_DATE	U_8_R	782

Function	Register Name	Type	Reg.
	LOG_SAMPLE_HOUR	U_8_R	785
	LOG_SAMPLE_MINUTE	U_8_R	786
	LOG_SAMPLE_MONTH	U_8_R	783
	LOG_SAMPLE_REG1	U_8_R	788
	LOG_SAMPLE_REG2	U_8_R	789
	LOG_SAMPLE_REG3	U_8_R	790
	LOG_SAMPLE_REG4	U_8_R	791
	LOG_SAMPLE_SECOND	U_8_R	787
	LOG_SAMPLE_TRIGGER	U_8_R	781
	LOG_SAMPLE_YEAR	U_8_R	784
Digital	DIGITAL_OUT	U_32	808
	DO_1	B_0	808
	to	to	
	DO_32	B_31	808
Digital Read Only	DI_1	B_0_R	809
	to	to	
	DI_32	B_31_R	809
	DIGITAL_IN	U_32_R	809
	IO_TYPE	U_8_R	810
Display	BRIGHTNESS	U_8	148
	CODE_BLANKING	U_16	705
	CURRENT_ALPHA_CHARACTER	U_8	159
	CURRENT_DISPLAY_FORMAT	U_8	158
	DATA_SOURCE_DISPLAY1	U_8	170
	DATA_SOURCE_DISPLAY2	U_8	171
	DATA_SOURCE_DISPLAY3	U_8	172
	DATA_SOURCE_PEAK_VALLEY	U_8	173
	DISPLAY	S_32	2
	DISPLAY_FORMAT_DEFAULT	O_8	199
	PEAK	S_32	12
	SETPOINT_BLANKING	U_16	706
	TARE	S_32	14
	TEXT_CHARACTER_DEFAULT	U_8	206
	VALLEY	S_32	13
	VIEW_MODE_BLANKING	U_16	707
Display Bargraph	BAR_COLOUR	U_16	101
	BAR_HIGH	S_32	100
	BAR_LOW	S_32	99
	BAR_ZERO	U_8	220
Display Format	DISPLAY_FORMAT_CH1	O_8	200
	DISPLAY_FORMAT_CH2	O_8	201
	DISPLAY_FORMAT_CH3	O_8	202
	DISPLAY_FORMAT_CH4	O_8	203
	DISPLAY_FORMAT_RESULT	O_8	225
	DISPLAY_FORMAT_TOTAL1	O_8	204
	DISPLAY_FORMAT_TOTAL2	O_8	205

Function	Register Name	Type	Reg.
	TEXT_CHARACTER_CH1	U_8	207
	TEXT_CHARACTER_CH2	U_8	208
	TEXT_CHARACTER_CH3	U_8	209
	TEXT_CHARACTER_CH4	U_8	210
	TEXT_CHARACTER_RESULT	U_8	226
	TEXT_CHARACTER_TOTAL1	U_8	211
	TEXT_CHARACTER_TOTAL2	U_8	212
Display Text	Channel1_Text	L_32_T	T
	Channel2_Text	L_32_T	U
	Channel3_Text	L_32_T	V
	Channel4_Text	L_32_T	W
	Over_Text	L_8_T	R
	Peak_Text	L_32_T	H
	Print_String	L_32_T	X
	RegB_STRING	L_32_T	B
	Setpoint1_Text	L_32_T	L
	Setpoint2_Text	L_32_T	M
	Setpoint3_Text	L_32_T	N
	Setpoint4_Text	L_32_T	O
	Setpoint5_Text	L_32_T	P
	Setpoint6_Text	L_32_T	Q
	Total1_Text	L_32_T	J
	Total2_Text	L_32_T	K
	Under_Text	L_8_T	S
	Valley_Text	L_32_T	I
Display User Auxiliary	AUX1	S_32	244
	AUX2	S_32	243
	AUX3	S_32	242
	AUX4	S_32	241
	AUX5	S_32	240
	AUX6	S_32	239
	AUX7	S_32	238
	AUX8	S_32	237
Edit Mode	EDIT_DEF	S_32	773
	EDIT_MAX	S_32	771
	EDIT_MIN	S_32	772
	EDIT_STATE	U_8	774
	EDIT_VALUE	S_32	49
	NON_VOLATILE_WRITE	B_5	157

Function	Register Name	Type	Reg.
Linearization 1	TABLE1_DATE	U_16	711
	TABLE1_SERIAL_NO	U_16	715
	TABLE1_INPUT1	S_24	257
	to		to
	TABLE1_INPUT32	S_24	288
	TABLE1_OUTPUT1	S_24	289
	to		to
	TABLE1_OUTPUT32	S_24	320
Linearization 2	TABLE2_DATE	U_16	712
	TABLE2_SERIAL_NO	U_16	716
	TABLE2_INPUT1	S_24	321
	to		to
	TABLE2_INPUT32	S_24	352
	TABLE2_OUTPUT1	S_24	353
	to		to
	TABLE2_OUTPUT32	S_24	384
Linearization 3	TABLE3_DATE	U_16	713
	TABLE3_SERIAL_NO	U_16	717
	TABLE3_INPUT1	S_24	385
	to		to
	TABLE3_INPUT32	S_24	416
	TABLE3_OUTPUT1	S_24	396
	to		to
	TABLE3_OUTPUT32	S_24	448
Linearization 4	TABLE4_DATE	U_16	714
	TABLE4_SERIAL_NO	U_16	718
	TABLE4_INPUT1	S_24	449
	to		to
	TABLE4_INPUT32		480
	TABLE4_OUTPUT1	S_24	481
	to		to
	TABLE4_OUTPUT32	S_24	512
PID 1	PID1_ANTI_RESET_WINDUP	U_16	754
	PID1_CYCLE_TIME	U_16	756
	PID1_DERIVATIVE_VALUE	U_16	77
	PID1_ERROR_SUM	F_32	52
	PID1_INTEGRAL_TERM	F_32	53
	PID1_INTEGRAL_VALUE	U_16	71
	PID1_OUTPUT	U_16	50
	PID1_PROPORTIONAL_BAND	U_16	65
	PID1_SPAN	S_32	115
PID 2	PID2_ANTI_RESET_WINDUP	U_16	755
	PID2_CYCLE_TIME	U_16	757
	PID2_DERIVATIVE_VALUE	U_16	78
	PID2_INTEGRAL_VALUE	U_16	72
	PID2_OUTPUT	U_16	51

Function	Register Name	Type	Reg.
	PID2_PROPORTIONAL_BAND	U_16	66
	PID2_SPAN	S_32	116
Result	RESULT	S_32	254
	RESULT_PROCESSED	S_32	3
	RESULT_RAW	S_32	18
	RESULT_SCALED	S_32	21
Result Setup	AUTO_ZERO_RESULT	S_16	227
	AVERAGING_SAMPLES_RESULT	U_8	749
	AVERAGING_WINDOW_RESULT	U_16	744
	AZ_APERTURE_BAND_RESULT	U_16	766
	AZ_CAPTURE_BAND_RESULT	U_8	734
	AZ_MOTION_BAND_RESULT	U_8	739
	DATA_SOURCE_RESULT	U_8	178
	OFFSET_RESULT	S_32	27
	SCALE_FACTOR_RESULT	F_32	24
Serial Port	BAUDRATE	U_8	149
	RECEIVE_BUFFER	U_8	1026
	RECEIVE_COUNT	U_8	1025
	RECEIVE_FLAGS	U_8	807
	RECEIVE_READY	B_0	807
	RECEIVE_RESULT	S_32	106
	SERIAL_ADDRESS	U_8	150
	STRING_CHARACTER	U_8	801
	STRING_LENGTH	U_8	802
Setpoints	SETPOINT_LATCH_FLAGS	U_8	221
	SP_POWERON_INHIBIT_FLAGS	U_8	162
	TRIGGER_STATUS	U_8_R	233
Setpoint 1	SETPOINT1	S_32	6
	SP1	B_0	1
	SP1_REMOTE	B_8	1
	SP1_STATUS	B_0_R	224
	SP1_TRIGGER	U_8	775
	TRIGGER1	B_0_R	233
Setpoint 1 Setup	POWERON_INHIBIT_SP1	B_0	162
	RLY1_DE_ENERGISE	B_0	222
	SP1_BREAK_DELAY	U_16	77
	SP1_CONTROL	O_8	142
	SP1_DATA_SOURCE	U_8	179
	SP1_DELAY_TYPE	U_8	193
	SP1_HYST	U_16	65
	SP1_LATCH	B_0	221
	SP1_MAKE_DELAY	U_16	71
	SP1_RESET_DESTINATION	U_8	185
	SP1_RESET_VALUE	S_32	115

Function	Register Name	Type	Reg.
	SP1_TRACKING	U_8	164
Setpoint 2	SETPOINT2	S_32	7
	SP2	B_1	1
	SP2_REMOTE	B_9	1
	SP2_STATUS	B_1_R	224
	SP2_TRIGGER	U_8	776
	TRIGGER2	B_1_R	233
Setpoint 2 Setup	POWERON_INHIBIT_SP2	B_1	162
	RLY2_DE_ENERGISE	B_1	222
	SP2_BREAK_DELAY	U_16	78
	SP2_CONTROL	O_8	143
	SP2_DATA_SOURCE	U_8	180
	SP2_DELAY_TYPE	U_8	194
	SP2_HYST	U_16	66
	SP2_LATCH	B_1	221
	SP2_MAKE_DELAY	U_16	72
	SP2_RESET_DESTINATION	U_8	186
	SP2_RESET_VALUE	S_32	116
	SP2_TRACKING	U_8	165
Setpoint 3	SETPOINT3	S_32	8
	SP3	B_2	1
	SP3_REMOTE	B_10	1
	SP3_STATUS	B_2_R	224
	SP3_TRIGGER	U_8	777
	TRIGGER3	B_2_R	233
Setpoint 3 Setup	POWERON_INHIBIT_SP3	B_2	162
	RLY3_DE_ENERGISE	B_2	222
	SP3_BREAK_DELAY	U_16	79
	SP3_CONTROL	O_8	144
	SP3_DATA_SOURCE	U_8	181
	SP3_DELAY_TYPE	U_8	195
	SP3_HYST	U_16	67
	SP3_LATCH	B_2	221
	SP3_MAKE_DELAY	U_16	73
	SP3_RESET_DESTINATION	U_8	187
	SP3_RESET_VALUE	S_32	117
	SP3_TRACKING	U_8	166
Setpoint 4	SETPOINT4	S_32	9
	SP4	B_3	1
	SP4_REMOTE	B_11	1
	SP4_STATUS	B_3_R	224
	SP4_TRIGGER	U_8	778
	TRIGGER4	B_3_R	233
Setpoint 4 Setup	POWERON_INHIBIT_SP4	B_3	162
	RLY4_DE_ENERGISE	B_3	222

Function	Register Name	Type	Reg.
	SP4_BREAK_DELAY	U_16	80
	SP4_CONTROL	O_8	145
	SP4_DATA_SOURCE	U_8	182
	SP4_DELAY_TYPE	U_8	196
	SP4_HYST	U_16	68
	SP4_LATCH	B_3	221
	SP4_MAKE_DELAY	U_16	74
	SP4_RESET_DESTINATION	U_8	188
	SP4_RESET_VALUE	S_32	118
	SP4_TRACKING	U_8	167
Setpoint 5	SETPOINT5	S_32	10
	SP5	B_4	1
	SP5_REMOTE	B_12	1
	SP5_STATUS	B_4_R	224
	SP5_TRIGGER	U_8	779
	TRIGGER5	B_4_R	233
Setpoint 5 Setup	POWERON_INHIBIT_SP5	B_4	162
	RLY5_DE_ENERGISE	B_4	222
	SP5_BREAK_DELAY	U_16	81
	SP5_CONTROL	O_8	146
	SP5_DATA_SOURCE	U_8	183
	SP5_DELAY_TYPE	U_8	197
	SP5_HYST	U_16	69
	SP5_LATCH	B_4	221
	SP5_MAKE_DELAY	U_16	75
	SP5_RESET_DESTINATION	U_8	189
	SP5_RESET_VALUE	S_32	119
	SP5_TRACKING	U_8	168
Setpoint 6	SETPOINT6	S_32	11
	SP6	B_5	1
	SP6_REMOTE	B_13	1
	SP6_STATUS	B_5_R	224
	SP6_TRIGGER	U_8	780
	TRIGGER6	B_5_R	233
Setpoint 6 Setup	POWERON_INHIBIT_SP6	B_5	162
	RLY6_DE_ENERGISE	B_5	222
	SP6_BREAK_DELAY	U_16	82
	SP6_CONTROL	O_8	147
	SP6_DATA_SOURCE	U_8	184
	SP6_DELAY_TYPE	U_8	198
	SP6_HYST	U_16	70
	SP6_LATCH	B_5	221
	SP6_MAKE_DELAY	U_16	76
	SP6_RESET_DESTINATION	U_8	190
	SP6_RESET_VALUE	S_32	120
	SP6_TRACKING	U_8	169

Function	Register Name	Type	Reg.
Smart Module	SMART_RESULT1	S_32	54
	SMART_RESULT2	S_32	55
	SMART_RESULT3	S_32	56
	SMART_RESULT4	S_32	57
	SMART_RESULT5	S_32	58
	SMART_RESULT6	S_32	59
	SMART_RESULT7	S_32	60
Smart Module Setup	SMART_CAL1	F_32	730
	SMART_CAL2	F_32	731
	SMART_CAL3	F_32	732
	SMART_CAL4	F_32	733
	SMART_RESET_OFFSET1	S_32	121
	SMART_RESET_OFFSET2	S_32	122
	SMART_SETUP1	O_8	758
	SMART_SETUP2	O_8	759
	SMART_SETUP3	O_8	760
Smart Module Setup Read Only	SMART_ID	U_8_R	765
	SMART_VERSION	U_8_R	814
Status	ALARM_STATUS	U_16	1
	ANNUNCIATORS	U_16	163
	COUNT2_DIRECTION	B_7_R	152
	EEPROM_MEMORY_SIZE	U_8_R	223
	LED1	B_5	163
	LED2	B_4	163
	LED3	B_3	163
	LED4	B_2	163
	LED5	B_1	163
	LED6	B_0	163
	LIGHT_BAR	U_8	220
	LIGHT_BAR1	B_0	220
	LIGHT_BAR2	B_1	220
	LIGHT_BAR3	B_2	220
	LIGHT_BAR4	B_3	220
	LIGHT_BAR5	B_4	220
	LIGHT_BAR6	B_5	220
	LIGHT_REMOTE	B_7	220
	MUX0	B_8_R	152
	MUX1	B_9_R	152
	RELAY_DE_ENERGISE_FLAGS	U_8	222
	RELAY_STATUS	U_8	156
	RELAY1	B_0	156
	RELAY2	B_1	156
	RELAY3	B_2	156
	RELAY4	B_3	156
	RELAY5	B_4	156
	RELAY6	B_5	156
	REMOTE_LED1	B_13	163

Function	Register Name	Type	Reg.
	REMOTE_LED2	B_12	163
	REMOTE_LED3	B_11	163
	REMOTE_LED4	B_10	163
	REMOTE_LED5	B_9	163
	REMOTE_LED6	B_8	163
	SETPOINT_STATUS_FLAGS	U_8_R	224
	STATE	U_16	232
	TREND_DOWN	B_7	1
	TREND_UP	B_6	1
	VIEW_POINTER	U_8	155
Status Switches Rear Pins	CAPTURE_PIN	B_2_R	152
	COUNT2_INPUT	B_6_R	152
	D1	B_3_R	152
	D2	B_4_R	152
	D3	B_5_R	152
	DIGITAL_IO	U_16	152
	HOLD_PIN	B_0_R	152
	LOCK_PIN	B_1_R	152
Status Switches Switches	DOWN_BUTTON	B_1	151
	F1_BUTTON	B_5	151
	F2_BUTTON	B_6	151
	F3_BUTTON	B_7	151
	LOCK_DOWN_SWITCH	B_4	151
	LOCK_UP_SWITCH	B_3	151
	PROG_BUTTON	B_0	151
	REMOTE_SWITCH	B_15	151
	SWITCHES	U_16	151
	UP_BUTTON	B_2	151
Timers	TIMER1	U_32	95
	TIMER2	U_32	96
Total 1	CUTOFF1	S_16	763
	DATA_SOURCE_TOTAL1	U_8	176
	INPUT_RATE1	U_16	811
	K_FACTOR1	S_32	761
	RATE_TOTALIZER1	U_8	803
	TOTAL1	S_32	16
Total 2	CUTOFF2	S_16	764
	DATA_SOURCE_TOTAL2	U_8	177
	INPUT_RATE2	U_16	812
	K_FACTOR2	S_32	762
	RATE_TOTALIZER2	U_8	804
	TOTAL2	S_32	17

Function	Register Name	Type	Reg.
User Memory	USER_MEMORY_1	S_16	5121
	to		to
	USER_MEMORY_1024	S_16	6144
User Variables Floating Point	VARIABLE_A_FP	F_32	805
	VARIABLE11	F_32	107
	VARIABLE12	F_32	108
	VARIABLE13	F_32	109
	VARIABLE14	F_32	110
	VARIABLE15	F_32	111
	VARIABLE16	F_32	112
	VARIABLE17	F_32	113
	VARIABLE18	F_32	114
User Variables Integers	VARIABLE_A_INT	S_32	806
	VARIABLE1	S_32	85
	VARIABLE2	S_32	86
	VARIABLE3	S_32	87
	VARIABLE4	S_32	88
	VARIABLE5	S_32	89
	VARIABLE6	S_32	90
	VARIABLE7	S_32	91
	VARIABLE8	S_32	92
	VARIABLE9	S_32	93
	VARIABLE10	S_32	94
Miscellaneous	CPU_LOADING	U_8_R	815
	DATALOG_MEM_SIZE	U_8	813
	INC_DEC_DISPLAY	S_32	708
	MACRO_SIZE	U_16_R	816
	MANUAL_LOADER_DISPLAY	S_32	719
	RegA_STRING	L_32_T	A
	RegC_STRING	L_32_T	C
	RegD_STRING	L_32_T	D
	RegE_STRING	L_32_T	E
	RegF_STRING	L_32_T	F
	RegG_STRING	L_32_T	G
	RegY_STRING	L_32_T	Y
	RegZ_STRING	L_32_T	Z
	SECURITY_BYTE	U_8	161
	SPAN	S_32	709
	ZERO	S_32	710

Notes:

Modbus Register Access

Most of the working registers in the meter are accessible via the Modbus interface. Although the internal registers of the meter may vary in size from 8 to 32 bits wide, each Modbus address always accesses a 16 bit word.

8 bit Registers

In cases where the internal register is only an 8 bit value, the MSB will be set to zero (if the register is an 8 bit unsigned value) or to the sign (if the register is an 8 bit signed value).

32 bit Registers

In cases where the internal register is a 32 bit value, two Modbus registers are used to access the data. If the internal register is a 32 bit fixed point number then the LSW is referenced by the lowest register number of the register pair followed by the MSW, which is referenced by the highest register number of the pair.

For example;
If register pair 40601/40602 point to a 32 bit long which contains the value 12345678 (0xBC614E hex) then

40601 = 0x61 0x4E
40602 = 0x00 0xBC

If the internal register is a 32 bit floating point number then the lowest register number of the register pair gives the least significant 16 bits of the mantissa, while the highest register number of the pair gives the sign, 8 bits of exponent and the most significant 7 bits of the mantissa.

For example;
If register pair 40601/40602 point to a 32 bit float which contains the value –12.5 (0xC1480000 hex) then

40601 = 0x00 0x00
40602 = 0XC1 0x48

Any accesses to 32 bit registers must be executed within the same frame by addressing the lowest register number of the register pair with the register count set to two. Multiple 32 bit registers can still be accessed in a string.

If only the highest register number of the register pair is accessed, an exception error will be sent in response.

32 Bit Register Pairs

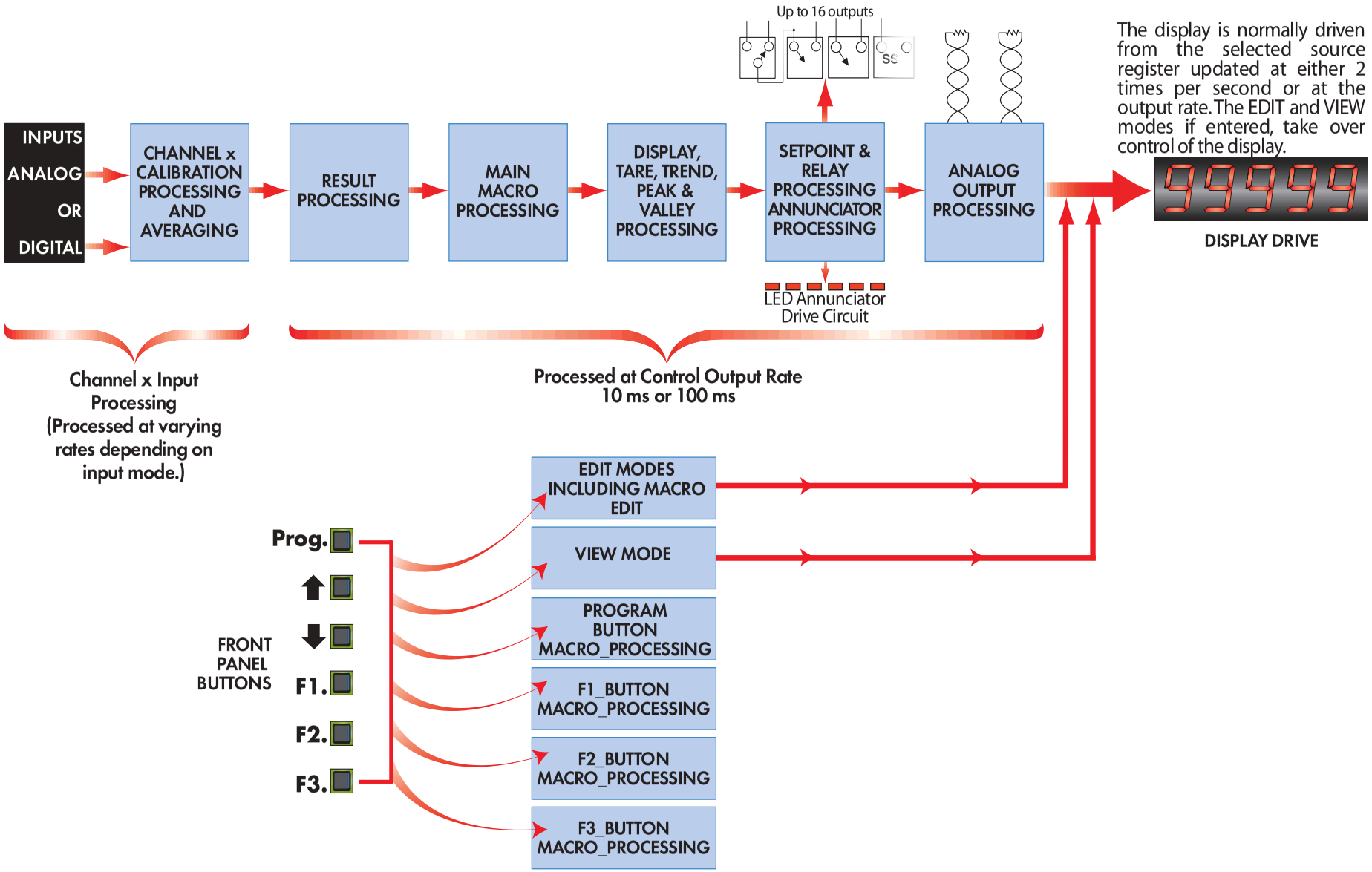
The register pairs 40513 – 40645 all access 32 bit data registers inside the meter. Register pairs 40513 – 40545 are the most commonly accessed registers.

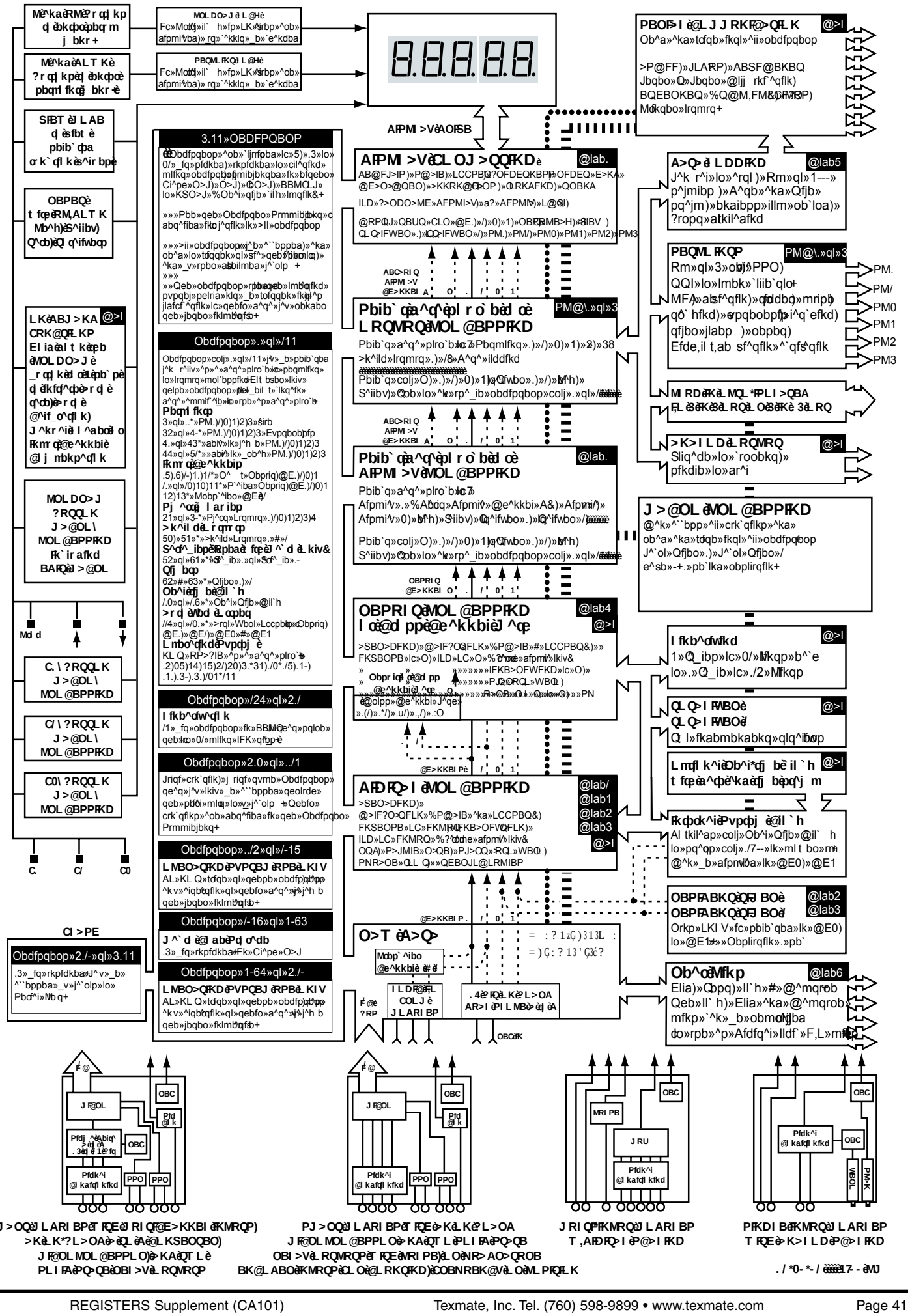
32 Bit Register Pairs	Function	ASCII Reg.
40513/40514	Display Register	2
40515/40516	Processed Data - Result	3
40517/40518	Processed Data - Channel 1	4
40519/40520	Processed Data - Channel 2	5
40521/40522	Processed Data - Channel 3	39
40523/40524	Processed Data - Channel 4	40
40525/40526	Peak	12
40527/40528	Valley	13
40529/40530	Total 1	16
40531/40532	Total 2	17
40533/40534	Tare	14
40535/40536	SP 1	6
40537/40538	SP 2	7
40539/40540	SP 3	8
40541/40542	SP 4	9
40543/40544	SP 5	10
40545/40546	SP 6	11
40547/40548	Raw Data - Result	18
40549/40550	Raw Data - Channel 1	19
40551/40552	Raw Data - Channel 2	20
40553/40554	Raw Data - Channel 3	41

32 Bit Register Pairs	Function	ASCII Reg.
40555/40556	Raw Data - Channel 4	42
40557/40558	Scaled Data - Result	21
40559/40560	Scaled Data - Channel 1	22
40561/40562	Scaled Data - Channel 2	23
40563/40564	Scaled Data - Channel 3	43
40565/40566	Scaled Data - Channel 4	44
40567/40568	Scale Value Result - floating point	24
40569/40570	Scale Value Ch1 - floating point	25
40571/40572	Scale Value Ch2 - floating point	26
40573/40574	Scale Value Ch3 - floating point	102
40575/40576	Scale Value Ch4 - floating point	103
40577/40578	Offset Value - Result	27
40579/40580	Offset Value - Channel 1	28
40581/40582	Offset Value - Channel 2	29
40583/40584	Offset Value Ch3	104
40585/40586	Offset Value Ch4	105
40587/40588	D/A Zero - Analogue O/P 1	34
40589/40590	D/A Zero - Analogue O/P 2	36
40591/40592	D/A Full Scale - Analogue O/P 1	35
40593/40594	D/A Full Scale - Analogue O/P 2	37
40595/40596	32 bit Long timer 1 - 0.1 sec	95
40597/40598	32 bit Long timer 2 - 0.1 sec	96
40599/40600	32 bit Variable 1 - fixed point	85
40601/40602	32 bit Variable 2 - fixed point	86
40603/40604	32 bit Variable 3 - fixed point	87
40605/40606	32 bit Variable 4 - fixed point	88
40607/40608	32 bit Variable 5 - fixed point	89
40609/40610	32 bit Variable 6 - fixed point	90
40611/40612	32 bit Variable 7 - fixed point	91
40613/40614	32 bit Variable 8 - fixed point	92
40615/40616	32 bit Variable 9 - fixed point	93
40617/40618	32 bit Variable 10 - fixed point	94
40619/40620	32 bit Variable 11 - floating point	107
40621/40622	32 bit Variable 12 - floating point	108
40623/40624	32 bit Variable 13 - floating point	109
40625/40626	32 bit Variable 14 - floating point	110
40627/40628	32 bit Variable 15 - floating point	111
40629/40630	32 bit Variable 16 - floating point	112
40631/40632	32 bit Variable 17 - floating point	113
40633/40634	32 bit Variable 18 - floating point	114
40635/40636	SP1 Reset Value	115
40637/40638	SP2 Reset Value	116
40639/40640	SP3 Reset Value	117
40641/40642	SP4 Reset Value	118
40643/40644	SP5 Reset Value	119
40645/40646	SP6 Reset Value	120

BLOCK DIAGRAM

CONTROL AND OUTPUT PROCESSING





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Notes:

Notes:

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