MODEL 9100
Remote Readout

DESIGN CONCEPTS

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SPECIFICATIONS:

Power Requirements:

- AC: 105VAC to 132VAC @ 50mA (47Hz to 63Hz).
- AC: 198VAC to 264VAC @ 50mA (47Hz to 63Hz) optional.

Display:

- Type: Six digit, seven segment LED 0.56” (14.3mm) high.
- Polarity indication "-" displayed.
- Display Dimming via RS232/485

Relay Outputs (Optional):

- Two from "A" relay closures rated .5A at 28VDC (resistive)

Environmental:

- Operating temperature range: -20°C to +60°C
- Storage temperature range: -25°C to +85°C
- Relative humidity: 0% to 90%, non-condensing

Dimensions:

- Case size "D" refer to page 8.
- Weight: 1 pound
- I/O terminations: five quick disconnect terminals.

Serial Interface:

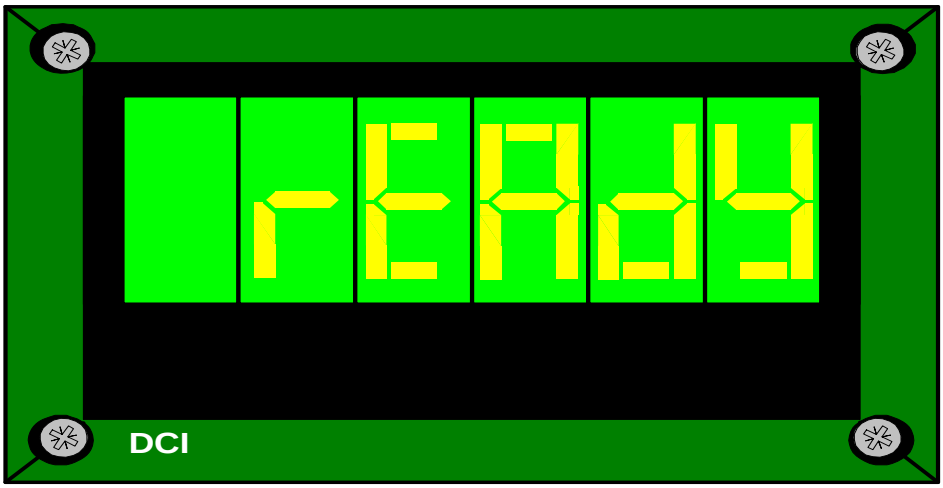
- ASCII RS-232 or RS-485 compatible (select one); format 1 start bit, 8 data bits, 1 stop bit, and no parity bits. Baud rates: 9600, 4800, 2400, 1200, 600, 300, 150, & 75.

Programming:

- Four switches behind front panel lens to setup interface parameters.

OPTIONS:

- 01 RS-232 Compatible Interface
- 02 RS-485 Compatible Interface
- 05 +5VDC input power 500mA max
- 12 +9-18VDC input power 400mA max
- 22 230VAC; 50Hz-63Hz input power
- 23 Green LED display
- 24 +18-36VDC input power 300mA
- 25 Special legends and/or logo
- 26 No logo
- 50 Sunlight readable red LED



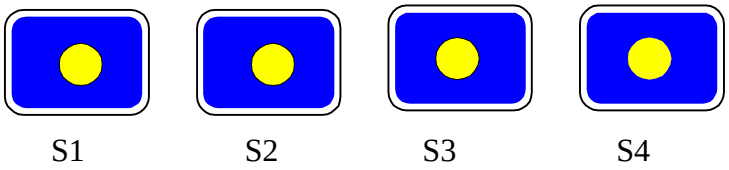
DESCRIPTION:

The 9100 is a 6 digit slave display for use with computers, PLCs, DCI Inc. panel meters and other instruments producing a serial ASCII output. Interfaces to the 9100 can be standard RS-232 or RS-485. The display has 0.56 inch high, seven segment LED digits separated by decimal points: 8.8.8.8.8.8 The unit can display any combination of numbers, spaces and several alpha characters. Note the special possibility that the display may show a degree symbol before the last digit. This allows the display to show a temperature with a C or F following the number. The unit also has addressing capability allowing it to be connected with several other units and be selected individually. While only six digits can be displayed the units can be set to left or right justify the input string to show just the first or last six digits of the input string.

RS-232/RS-485 INPUT AND DISPLAY:

The 9100 is a 6 digit serial remote readout and display. The unit updates the display with ASCII character strings received via the RS-232/RS-485 input. The end of string can be determined several different ways. The end of string can be one single character or a set of two characters. If a single character is used it can be a Carriage Return <CR> or a Line Feed <LF> or a ASCII <EXT> character. If two characters are used the string can still be terminated with a single ASCII <EXT> character. The 9100 uses a data format of 8 data bits, 1 stop bit, and no parity, at the available baud rates of 75, 150, 300 ,600, 1200, 2400, 4800, and 9600. The addressing capability allows several units to be connected at the same time. If only one unit is used then the address is set to 0 and the address header is not needed.

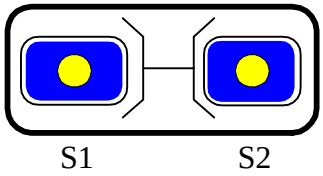
SWITCH FUNCTIONS:
On the front of the 9100 will be four switches that are placed behind the front lens. Each switch is designated from left to right as S1, S2, S3, and S4. The functions for each switch are as follows:



S1: Pressing this switch will send a hex 11 (ASCII DC1) out the serial port or enter setup mode.
S2: Pressing this switch will send a hex 12 (ASCII DC2) out the serial port or enter setup mode or change data in setup.
S3: Pressing this switch will send a hex 13 (ASCII DC3) out the serial port or change data in setup..
S4: Pressing this switch will send a hex 0d (ASCII CR) out the serial port.

SETUP:

The meter setup is accomplished by using the four front switches, that are located behind the front lens. The setup mode is entered by pressing S1 and S2 switches simultaneously. The setup procedures are as follows.



Startup Message:

Upon entering the setup mode the display shows 

where "x" is either "on" or "off". By pressing S3 you can toggle back and forth from on and off. When set to off the unit will not display the "dciinc", "9100", and the version number on power up. Press S1 switch to proceed with the setup.

Note: When this mode is on, the top right LED will flash when the unit receives data. Also the bottom LED will come on when the unit is enabled, only if a address of 1-255 is used.

Serial Address Selection:

Display will show 

where "xxx" is the unit address. The address used must be in the range of 0 to 255. Pressing S2 will increment the address and pressing S3 will decrement the address. Press S1 switch to proceed with the setup.

Note: If the address is set to "0" the unit will respond to any query sent to it.

Baud Rate Setup:

Display will show 

where "xxxx" is the setting of the baud rate. Pressing S3 will cycle through the available baud rate settings. The number displayed is the baud rate for the RS-232/RS-485 output. Press S1 switch to proceed with the setup.

Echo Selection:

Display will show 

where "x" is either "on" or "off". The echo command is used to turn the auto echo function on or off. When on, the unit automatically re-transmits all received serial data. Pressing S3 will cycle between on and off. Press S1 switch to proceed with the setup.

Justification Setting:

Display will show 

where "x" is "L", "r", and "of". The justification setting allows the unit to accept input strings of varying length. Possible justification settings are left, right, and none. Pressing S3 will cycle this parameter through its available options. Press S1 switch to proceed with the setup.

Note: When Set to left justification the unit will only display the first six characters received and ignore any other characters between the sixth character and the end of string terminator. When set to right justification the unit will only display the six characters before the end of string terminator and ignore any previous characters. When the justification is set to none the unit will display the first six characters received and will update the display upon receiving the sixth character. This is a special case which does not require an end of string terminator.

Input String Terminator:

Display will show 

where "x" is "1" or "2". This parameter sets whether one or two characters are needed for the end of string terminator. Pressing S3 will toggle the number. When set to 1, only 1 carriage return or line feed is needed to terminate the string and update the display. When set to 2, 2 characters are needed to terminate the string and update the display. These 2 characters can be 2 carriage returns, two line feeds, or one of each in any order. When set to two, the string can still be terminated with a parameter ASCII<ETX> character. Press S1 switch to proceed with setup.

Data Input Timeout:

Display will show [rToXXX] indicating that a receive time out setting can be entered. The time out range can be set from 0 to 255 seconds. The 0 setting is off and the display will never timeout. The timeout function will alert the operator when no data is received for a period of time greater than the selected time of 1 to 255 seconds. When timeout occurs the display will show [rc Err] which means receive error. When data is once again received the message will be replaced by the actual data received.

Unit Addressing:

To address the 9100 we use non-displayable ASCII characters to enable and disable the unit. To enable the unit, send the unit this ASCII string: **14xxx03**. The command to enable unit is decimal 14 the <SO> character. The "xxx" is the unit address. The decimal 03 is the <EXT> character, which must be placed at the end of the unit enable string. To disable the unit, send this ASCII string: **15xxx03**. The command to disable the unit is decimal 15 the <SI> character. The "xxx" is the unit address. The decimal 03 is the <EXT> character, which must be placed at the end of the unit disable string. If all units are RS-232, then the transmit pin of each unit would be connected to the receive pin of the next unit in the string. The transmit pin of the last unit may be left unconnected or be connected to the receive pin of the main sending unit. Note: that if the units are hooked in series this way each unit must have its echo turned on in order for the next unit down the line to get it's data. If all units are RS-485, then all units are simply hooked in parallel. The message to each unit would be like this: enable unit, send data, disable unit. For example: the data for unit with address 25 and the data of 123456 would look like this.

Decimal	14	50	53	03				Enable unit
ASCII	<SO>	2	5	<ETX>				
Decimal	49	50	51	52	53	54	13	Data
ASCII	1	2	3	4	5	6	<CR>	
Decimal	15	50	53	03				Disable unit
ASCII	<SI>	2	5	<ETX>				

RELAYS FOR SPECIALS ONLY:

Relays are turned on or off by control characters received via RS-232 or RS-485 input. The commands are as followed:

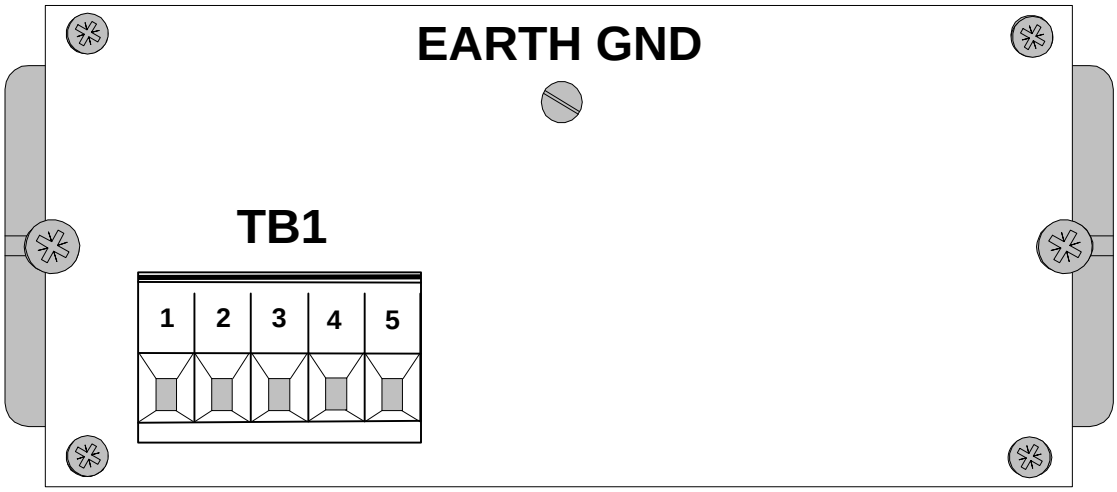
DC1: Turns relay 1 on.
DC2: Turns relay 2 on.
DC3: Turns relay 1 off.
DC4: Turns relay 2 off.

DISPLAY BRIGHTNESS:

Display brightness can be changed via RS-232 or RS-485 using addressing commands of 1 to 16, where 16 is the brightest.

9100 Back View

Figure 1.0



9100 Connections

TB1

1	15VAC Line/-DC Power
2	-115VAC Neutral/+DC Power
3	RS-232 Transmit/RS-485
4	RS-232 Receiver/RS-485
5	Digital Ground

Remote RS-232 Transmitter

Transmit	-	(Pin 4) Receive 9100
Digital Ground	-	(Pin 5) Digital Ground

Remote RS-485 Transmitter

TD+/RD+	-	(Pin 3) TD+/RD+
TD-/RD-	-	(Pin 4) TD-/RD-

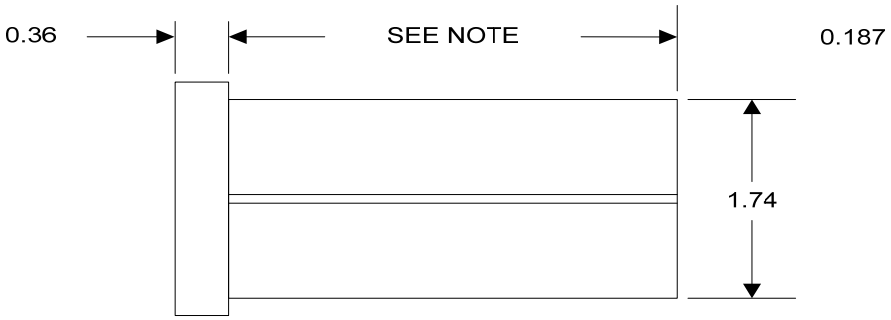
NOTE: For proper AC line filtering and safety precautions Pin 1 must be connected to Line, Pin 2 connected to neutral and unit must be tied to earth ground.

This chart is provided for the user to use as a reference in interfacing to the 9100

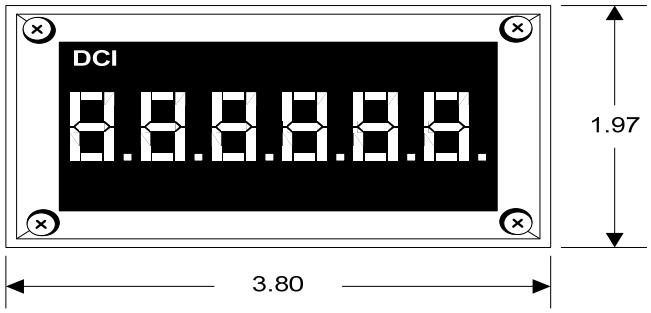
DEC	HEX	BIN	ASCII	DEC	HEX	BIN	ASCII	DEC	HEX	BIN	ASCII
0	00	000 0000	NUL	42	2A	010 1010	*	84	54	101 0100	T
1	01	000 0001	SOH	43	2B	010 1011	+	85	55	101 0101	U
2	02	000 0010	STX	44	2C	010 1100	′	86	56	101 0110	V
3	03	000 0011	ETX	45	2D	010 1101	-	87	57	101 0111	W
4	04	000 0100	EOT	46	2E	010 1110	.	88	58	101 1000	X
5	05	000 0101	ENQ	47	2F	010 1111	/	89	59	101 1001	Y
6	06	000 0110	ACK	48	30	011 0000	0	90	5A	101 1010	Z
7	07	000 0111	BEL	49	31	011 0001	1	91	5B	101 1011	[
8	08	000 1000	BS	50	32	011 0010	2	92	5C	101 1100	\
9	09	000 1001	HT	51	33	011 0011	3	93	5D	101 1101	]
10	0A	000 1010	LF	52	34	011 0100	4	94	5E	101 1110	^
11	0B	000 1011	VT	53	35	011 0101	5	95	5F	101 1111	_
12	0C	000 1100	FF	54	36	011 0110	6	96	60	110 0000	'
13	0D	000 1101	CR	55	37	011 0111	7	97	61	110 0001	a
14	0E	000 1110	SO	56	38	011 1000	8	98	62	110 0010	b
15	0F	000 1111	SI	57	39	011 1001	9	99	63	110 0011	c
16	10	001 0000	DLE	58	3A	011 1010	:	100	64	110 0100	d
17	11	001 0001	DC1	59	3B	011 1011	;	101	65	110 0101	e
18	12	001 0010	DC2	60	3C	011 1100	<	102	66	110 0110	f
19	13	001 0011	DC3	61	3D	011 1101	=	103	67	110 0111	g
20	14	001 0100	DC4	62	3E	011 1110	>	104	68	110 1000	h
21	15	001 0101	NAK	63	3F	011 1111	?	105	69	110 1001	i
22	16	001 0110	SYN	64	40	100 0000	@	106	6A	110 1010	j
23	17	001 0111	ETB	65	41	100 0001	A	107	6B	110 1011	k
24	18	001 1000	CAN	66	42	100 0010	B	108	6C	110 1100	l
25	19	001 1001	EM	67	43	100 0011	C	109	6D	110 1101	m
26	1A	001 1010	SUB	68	44	100 0100	D	110	6E	110 1110	n
27	1B	001 1011	ESC	69	45	100 0101	E	111	6F	110 1111	o
28	1C	001 1100	FS	70	46	100 0110	F	112	70	111 0000	p
29	1D	001 1101	GS	71	47	100 0111	G	113	71	111 0001	q
30	1E	001 1110	RS	72	48	100 1000	H	114	72	111 0010	r
31	1F	001 1111	US	73	49	100 1001	I	115	73	111 0011	s
32	20	010 0000	SP	74	4A	100 1010	J	116	74	111 0100	t
33	21	010 0001	!	75	4B	100 1011	K	117	75	111 0101	u
34	22	010 0010	"	76	4C	100 1100	L	118	76	111 0110	v
35	23	010 0011	#	77	4D	100 1101	M	119	77	111 0111	w
36	24	010 0100	$	78	4E	100 1110	N	120	78	111 1000	x
37	25	010 0101	%	79	4F	100 1111	O	121	79	111 1001	y
38	26	010 0110	&	80	50	101 0000	P	122	7A	111 1010	z
39	27	010 0111	`	81	51	101 0001	Q	123	7B	111 1011	{
40	28	010 1000	(	82	52	101 0010	R	124	7C	111 1100	|
41	29	010 1001	)	83	53	101 0011	S	125	7D	111 1101	}
								126	7E	111 1110	–
								127	7F	111 1111	DEL

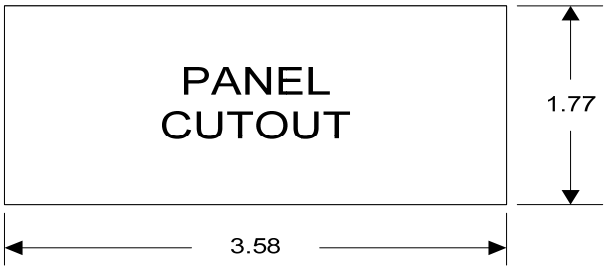
DIMENSIONS

CASE SIZE D



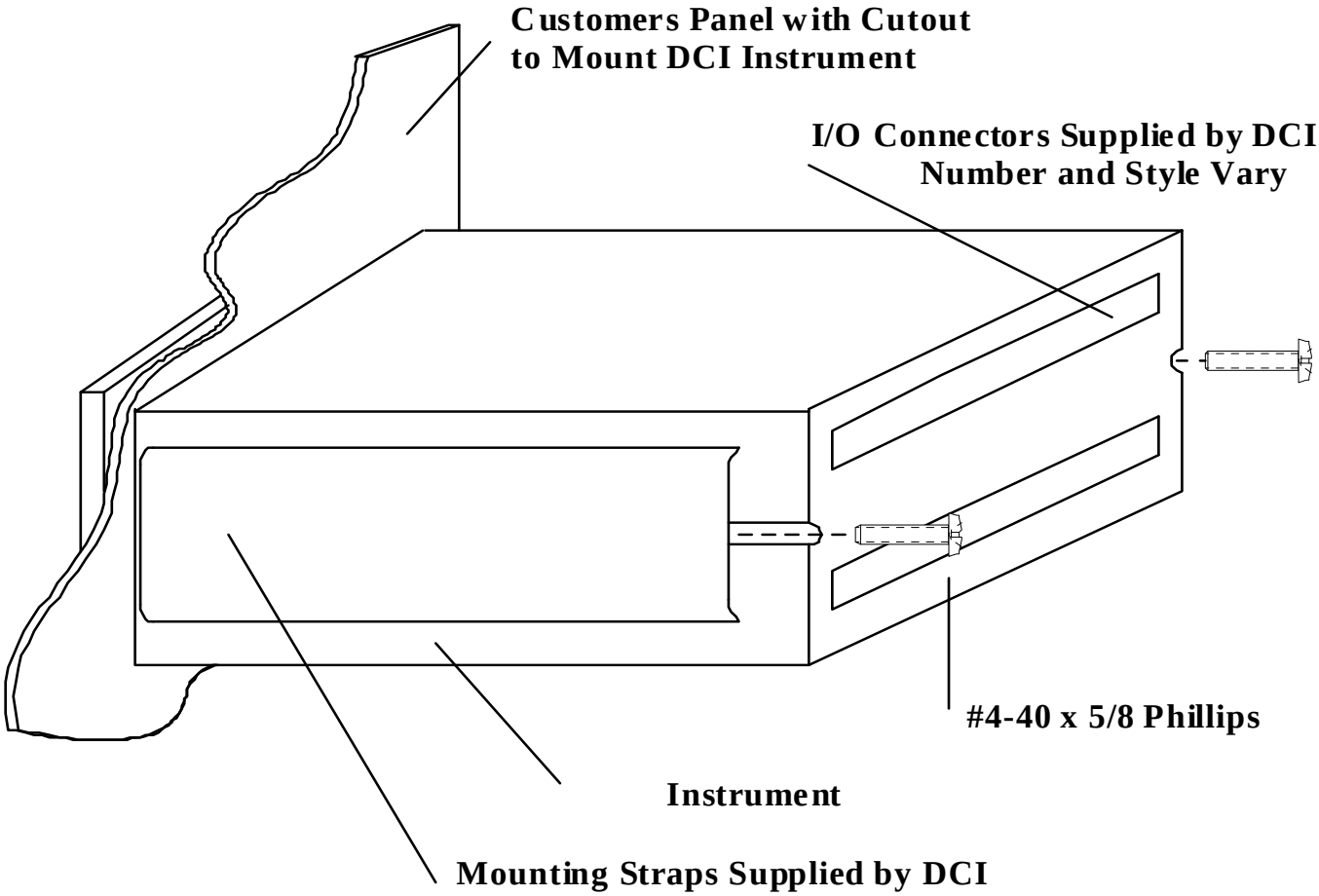
CASE DEPTH SERIES
SERIES 9000: 4.0"





ALL DIMENSIONS IN INCHES
PLEASE ADD .5 INCHES TO DEPTTH FOR REAR CONNECTORS

MOUNTING



Note: Ground Case per FIGURE 1.0, page 16

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