1 YEAR
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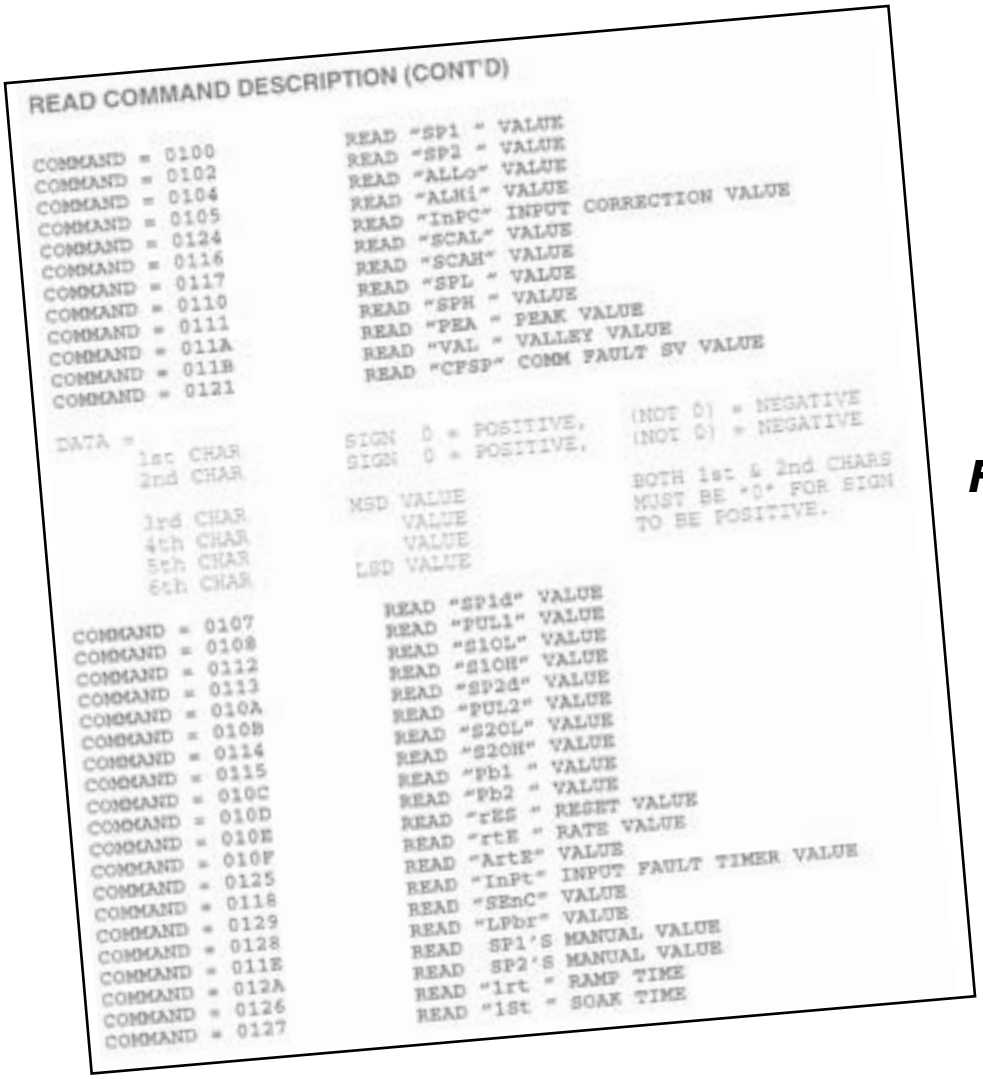
OMEGA™

User's Guide



READ COMMAND DESCRIPTION (CONT'D)

```
COMMAND = 0100          READ "SP1 " VALUE
COMMAND = 0102          READ "SP2 " VALUE
COMMAND = 0104          READ "ALLo" VALUE
COMMAND = 0105          READ "ALHi" VALUE
COMMAND = 0124          READ "InPC" INPUT CORRECTION VALUE
COMMAND = 0116          READ "SCAL" VALUE
COMMAND = 0117          READ "SCAH" VALUE
COMMAND = 0110          READ "SPL " VALUE
COMMAND = 0111          READ "SPH " VALUE
COMMAND = 011A          READ "PEA " PEAK VALUE
COMMAND = 011B          READ "VAL " VALLEY VALUE
COMMAND = 0121          READ "CFSP" COMM FAULT SV VALUE

DATA =
      1st CHAR          SIGN  0 = POSITIVE,   (NOT 0) = NEGATIVE
      2nd CHAR          SIGN  0 = POSITIVE,   (NOT 0) = NEGATIVE

      3rd CHAR          MSD VALUE             BOTH 1st & 2nd CHARS
      4th CHAR              VALUE             MUST BE "0" FOR SIGN
      5th CHAR              VALUE             TO BE POSITIVE.
      6th CHAR          LSD VALUE

COMMAND = 0107          READ "SP1d" VALUE
COMMAND = 0108          READ "PUL1" VALUE
COMMAND = 0112          READ "S1OL" VALUE
COMMAND = 0113          READ "S1OH" VALUE
COMMAND = 010A          READ "SP2d" VALUE
COMMAND = 010B          READ "PUL2" VALUE
COMMAND = 0114          READ "S2OL" VALUE
COMMAND = 0115          READ "S2OH" VALUE
COMMAND = 010C          READ "Pb1 " VALUE
COMMAND = 010D          READ "Pb2 " VALUE
COMMAND = 010E          READ "rES " RESET VALUE
COMMAND = 010F          READ "rtE " RATE VALUE
COMMAND = 0125          READ "ArtE" VALUE
COMMAND = 0118          READ "InPt" INPUT FAULT TIMER VALUE
COMMAND = 0129          READ "SEnC" VALUE
COMMAND = 0128          READ "LPbr" VALUE
COMMAND = 011E          READ  SP1'S MANUAL VALUE
COMMAND = 012A          READ  SP2'S MANUAL VALUE
COMMAND = 0126          READ "1rt " RAMP TIME
COMMAND = 0127          READ "1St " SOAK TIME
```

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CN76000
Protocol for RS-485 Communications Option (-485)

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CN76000 PROTOCOL FOR RS-485 COMMUNICATIONS OPTION (-485)
TABLE OF CONTENTS

SECTION 1 - COMMAND INTRODUCTION

The following 7 items define the conventions used in this Protocol manual

1. In the following examples, we use the terms **Host** and **Instrument**. **Host** is used to describe the computer operating as the originator of communications. **Instrument** is used to describe the process control(s) using this protocol.
2. All data is sent and received in the ASCII HEX character format using 10 bits:
   - 1 start bit
   - 8 data bits, no parity
   - 1 stop bit.
3. The **L** (ASCII 4C hex) is used as a filter character in the examples. The filter character prevents false addressing of other manufacturer's device on the same system.

   Address 00h should not be used. This is for Factory Service use only.

4. The checksum generated by the **Host** is obtained by adding all ASCII characters in hex, excluding the <stx>, filter character, and the <etx>. Only the lowest 8 bits are used. The checksum is inserted into the the message between the data field and the <etx>.

EXAMPLE: Host checksum calculation

```
                    32h       0100h             26h
<stx>   L      | <addr> <-- data -->      |  <cksm>  <etx>
                |                          |
 02     4C     |  33 32   30 31 30 30     |  37 39    03
                | <----------cksm-------->|
                |  33+32+30+31+30+30      |= 126h (use only the low byte)
```

---

5. The checksum generated by the **Instrument** is obtained by adding all ASCII characters in hex, excluding the <stx> and the <ack>. Only the lowest 8 bits are used. The checksum is inserted between the data field and the <ack>. Note that the filter character is included in the checksum calculation by **Instrument**.

EXAMPLE: Instrument checksum calculation

```
              32h        010015h                  D8h
<stx>    | L <addr><------ data ------->  |      <cksm>      <ack>
          |                                |
 02      | 4C 33 32 30 31 30 30 31 35     |      44  38       06
          | <-------------cksm----------->|
          | 4C+33+32+30+31+30+30+31+35    |  = 1D8h (use only the low byte)
```

---

6. Checksums are generated for all **Host** commands
7. Checksums are generated for all normal **Instrument** responses. A checksum is not sent when errors are reported to the **Host**.

COMMAND AND RESPONSE EXAMPLE NOTATIONS:

1. **[nu]** : "not used" at present time, (for future expansion). Undefined data, data returned should not be used.

2. **<data>** : These are ASCII characters shown in Hex notation. The upper case alpha character set is used for values A through F. (ASCII 46h = F, ASCII 33h = 3, etc.) Lower case is not used.

3.

ASCII control character	ASCII in hex	Description
<stx>	02	Start of Text
<etx>	03	End of Text
<ack>	06	Acknowledgment
L	4C	Filter character

4. Data can be in either Hex, BCD (Binary coded decimal), or Binary, expressed in ASCII format.

ASCII (in hex)	Hex (decimal)	BCD	Binary
30	0 h	0 d	0 0 0 0 b
31	1 h	1 d	0 0 0 1 b
32	2 h	2 d	0 0 1 0 b
33	3 h	3 d	0 0 1 1 b
34	4 h	4 d	0 1 0 0 b
35	5 h	5 d	0 1 0 1 b
36	6 h	6 d	0 1 1 0 b
37	7 h	7 d	0 1 1 1 b
38	8 h	8 d	1 0 0 0 b
39	9 h	9 d	1 0 0 1 b
41	A h		1 0 1 0 b
42	B h		1 0 1 1 b
43	C h		1 1 0 0 b
44	D h		1 1 0 1 b
45	E h		1 1 1 0 b
46	F h		1 1 1 1 b

All numbers shown in examples are in hex, unless otherwise noted. Hex = 2Fh
BCD (decimal) = 10d, Binary = 1101b. The h, d, b are symbols used in examples to indicate which number base is being used.

FIELD POSITION AND DESCRIPTION OF DATA FRAME

EXAMPLE: Typical READ command sequence.

Host wants to READ SP1 value from **Instrument** at address 32

Host command =

<stx>	L	<addr>	<– data –>	<cksm>	<etx>
		32h	0100h	26h	
			command		

Host command transmitted in ASCII hex =

02	4C	33 32	30 31 30 30	32 36	03

Instrument at address 32 replies with SP1 value of -15.

Instrument reply =

<stx>	L	<addr>	<—— data ——>		<cksm>	<ack>
		32h	01h	0015h	D8h	
			sign	value		

Instrument reply transmitted in ASCII hex =

02	4C	33 32	30 31	30 30 31 35	44 38	06

1. **Host** starts command with start of text <stx>, and filter character.
2. The address of the **Instrument** desired is next.
3. The Read data field is next. It contains the basic command for the **Instrument**. The Read data field is four characters long.
4. The **Host** now adds the calculated checksum to the command frame. Finally the end of text <etx> is appended.
5. The **Instrument** responds when the <etx> has been received. If the data frame is correct, the **Instrument** will perform the received command. If the data field contains a bad command or bad check-sum, an error message will be sent back to the **Host**. Details on errors will be explained later.
6. The **Instrument** starts its response with the start of text <stx> character, followed by the filter character.
7. The **Instrument's** address is next.
8. The Read data field is next. It contains the response to the command received. This field may be up to 10 characters long.
9. The **Instrument** now adds the calculated checksum to the response frame. Finally the acknowledge <ack> is appended.
10. The Command and Response interchange is now complete.

FIELD POSITION AND DESCRIPTION OF DATA FRAME (CONT'D)

EXAMPLE: Typical WRITE command sequence

Host wants to WRITE -15 to SP1 on **Instrument** at address 32

Host command =

<stx>	L	<addr>	<——— data ———>		<cksm>	<etx>
		32h	0200h	0015h	79h	
			command	value		
				FFh		
				sign		

Host command transmitted in ASCII hex =

02	4C	33 32	30 32 30 30	30 30 31 35	46 46	37 39	03

Instrument at address 32 replies that SP1 has been accepted

Instrument reply =

<stx>	L	<addr>	<data>	<cksm>	<ack>
		32h	00h	11h	

Instrument reply transmitted in ASCII hex =

02	4C	33 32	30 30	31 31	06

1. **Host** starts command with start of text <stx> and filter character.
2. The address of the **Instrument** desired is next.
3. The Write data field is next. It contains the basic command for the **Instrument** along with any data that may be required. The Write data field can be up to 10 characters long. Write commands are used to modify the **Instrument's** parameters.
4. The **Host** now adds the calculated checksum to the command frame. Finally the end of text <etx> is appended.
5. The **Instrument** responds when the <etx> has been received. If the Data frame is correct, the **Instrument** will perform the received command. If the data frame contains a bad command or a bad checksum, an error message will be sent back to the **Host**. An error will also occur if the value is not within the **Instrument's** range. Details on errors will be explained later.
6. The **Instrument** starts its response with the start of text <stx> character, followed by the filter character.
7. The **Instrument's** address is next.
8. The Data field is next. It contains the response to the command received.
9. The **Instrument** now adds the calculated checksum to the response frame. Finally the acknowledge <ack> is appended.
10. Command and Response interchange is now complete.

GENERAL NOTES:

- Some commands have restricted access, such that they may not be entered if the menu item is not currently available. An example would be an attempt to read the P.I.D. values while the menu is set for the SELF TUNE mode of operation. An error will be reported to the **Host** if such a command is given, or if the command cannot be carried out by the **Instrument.**
- Read commands will not change the **Instrument** display.
- Some Write commands will cause the Instrument display to show the menu item to be entered, as though the "ENTER" key had been pressed.

ERROR MESSAGES REPORTED

EXAMPLE: Checksum error detected by Instrument at address 32

Instrument responds to **Host's** last command with Error message

<stx>	L	<addr>	N	<error code>	<ack>
		32h	N	02h	
02	4C	33 32	4E	30 32	06

(Note the absence of Checksum.)

N = ASCII character (4Eh) used to note Error Present

Table 1 - Table of Error Messages possible from Instrument

<error code>	Description
00	not used
01	Undefined command. Command not within acceptable range.
02	Check-sum error on received data from **Host.**
03	Command not performed by **Instrument** (option not enabled, restricted read/write menu, check message.)
04	Illegal ASCII characters received in command. Instrument accepts only ASCII characters 0 through 9, A through F, and a through f in the data field.
05	Data field error. Not enough, to many, or improper positioning of characters in data field.
06	Undefined command. Command not within acceptable range.
07	not used
08, 09	Hardware fault. Return to Factory for service
10	Undefined command. Command not within acceptable range.

SECTION 2 - READ AND WRITE COMMANDS

READ AND WRITE COMMAND SUMMARY

READ COMMANDS	WRITE COMMANDS
00 PROCESS VARIABLE VALUE W/STATUS	———
05 FULL STATUS	———
	4 Digits
01 00 SP1 VALUE	02 00 SP1 VALUE XX
01 06 CY1 VALUE & S1Ot	02 06 CY1 VALUE
01 07 SP1d VALUE	———
01 08 PUL1 VALUE	———
03 13 S1St dir/rE	———
01 12 S1OL VALUE	———
01 13 S1OH VALUE	———
03 14 S1LP O on/OoFF	———
03 35 SP1o Outb/OutA	———
03 36 S2t AbS/dE	———
01 02 SP2 VALUE	02 02 SP2 VALUE XX
01 09 CY2 VALUE & S2Ot	02 07 CY2 VALUE
01 0A SP2d VALUE	———
01 0B PUL2 VALUE	———
03 15 S2St dir/rE	———
01 14 S2OL VALUE	———
01 15 S2OH VALUE	———
03 16 S2LP O on/OoFF	———
03 39 tunE SELF/Pid/SLO/nor/FASt	04 03 tunE MODE = SELF
	04 04 tunE MODE = FULL Pid
03 12 Strt YES/no	———
03 38 LErn Cont/End	———
03 2D dFAC VALUE	———
01 0C Pb1 VALUE	02 08 Pb1 VALUE
01 0D Pb2 VALUE	02 09 Pb2 VALUE
03 2C rES RESET AUTO/OFS (MANUAL) MODE	———
01 0E rES RESET VALUE	02 0A RESET VALUE AUTO MODE
	02 0B RESET VALUE OFFSET MODE
01 0F rtE RATE VALUE	02 0C RATE VALUE
03 2E Pid2 On/OFF	———
03 2F ArUP On/OFF	———
01 25 ArtE VALUE	———
01 04 ALLo VALUE	02 04 ALLo VALUE XX
01 05 ALHi VALUE	02 05 ALHi VALUE XX
03 37 AL OFF/Lo/Hi/HiLo	———
03 17 ALt AbS/dE	———
03 1B ALrE OnOF/Hold	———
03 1C ALPi On/OFF	———
03 3A ALiH On/OFF	———
03 18 ALSt OPEn/CLOS	———
03 19 ALLP O on/OoFF	———
03 22 ALbr On/OFF	———
	04 02 ALARM ACK

00 = Positive Value
FF= Negative Value

00 = Positive Value
FF= Negative Value

00 = Positive Value
FF= Negative Value

READ AND WRITE COMMAND SUMMARY (CONT'D)

READ COMMANDS	WRITE COMMANDS
03 34 SECr 1-4 SECURITY	———
03 23 Inp INPUT TYPE	———
03 25 OSUP On/OFF (FOR CURR & VOLT)	———
03 10 Unit F/C (FOR T/C & RTD)	———
03 26 Unit F/C/nonE	———
03 24 dPt DECIMAL POINT POSITION	———
01 18 InPt INPUT FAULT TIMER VALUE	———
01 29 SEnC VALUE	———
03 33 FiLt VALUE	———
01 24 InPC INPUT CORRECTION VALUE	———
01 28 LPbr VALUE	———
01 16 SCAL VALUE	———
01 17 SCAH VALUE	———
01 10 SPL VALUE	———
01 11 SPH VALUE	———
03 28 Auto On/OFF (OFF = MANUAL MODE)	04 05 Auto = On 04 06 Auto = OFF
01 1E AUTO/MAN SP1'S MANUAL VALUE	02 0F SP1'S MANUAL VALUE
01 2A AUTO/MAN SP2'S MANUAL VALUE	02 10 SP2'S MANUAL VALUE
01 1A PEA PEAK VALUE	04 07 PEAK RESET
01 1B VAL VALLEY VALUE	04 08 VALLEY RESET
01 1D SP1 & SP2 PERCENT OUTPUT VALUE	———
03 27 PctO On/OFF PERCENT OUTPUT INDICATION	04 0B PctO = On 04 0C PctO = OFF
03 30 Prog On/OFF	———
03 31 StAt On/OFF	———
01 26 1rt RAMP TIME	———
01 27 1St SOAK TIME	———
03 32 PEnd OoFF/Hold	———
01 21 CFSP COMM FAULT SV	02 0E CFSP COMM FAULT SV XX
03 2A LorE COMM rE/LOC	04 00 LorE = rE (REMOTE) 04 01 LorE = LOC (LOCAL)
03 2B nAt NO ACTIVITY TIMER VALUE	———
03 29 CFLt COMM FAULT MODE 2/1	———
———	04 0D RESET "ENTER PRESSED AT CN76000" FLAG TO "0"

00 = Positive Value

FF= Negative Value

READ COMMAND DESCRIPTION

Conventions Used

All commends appear in boldface type. Received data appears in plain type.

COMMAND = 00 **READ "PV" PROCESS VARIABLE VALUE W/STATUS**

RECEIVED DATA =

1st CHAR (BINARY)

AUTO ON/OFF 1=ON 0=OFF,MANUAL	COMM REM/LOC 1=REMOTE 0=LOCAL	ENTER KEY PRESSED? 1=YES 0=NO	ERROR PRESENT? 1=YES 0=NO, OK

2nd CHAR (BINARY)

ALARM RELAY 1=ENERGIZED 0=DEENERGIZED	[NU] not used	SV TYPE CFSV/LOCAL 1=CFSV 0=LOCAL	[NU] not used

3rd CHAR (BINARY)

[NU] not used	[NU] not used	[NU] not used	[NU] not used

4th CHAR (BINARY)

[NU] not used	[NU] not used	NO ACTIVITY TIMER nAt 1=TIMEOUT 0=NORMAL,OK	PV SIGN NEG/POS 1=NEGATIVE 0=POSITIVE

5th CHAR MOST SIGNIFICANT DIGIT PROCESS VARIABLE VALUE
6th CHAR PROCESS VARIABLE VALUE
7th CHAR PROCESS VARIABLE VALUE
8th CHAR LEAST SIGNIFICANT DIGIT PROCESS VARIABLE VALUE

NOTE: If ERROR PRESENT BIT = "1", issue a FULL STATUS READ COMMAND "05" to determine the specific error.

READ COMMAND DESCRIPTION (CONT'D)

COMMAND = 05 **READ FULL STATUS**

RECEIVED DATA =

1st CHAR (BINARY)

*1=FAIL TEST	[NU] not used	*1=CHECK CAL	*1=OFL OVERFLOW

2nd CHAR (BINARY)

*1=UFL UNDERFLOW	*1=BAD INPUT	*1=OPEN INPUT	*1=AREA

3rd CHAR (BINARY)
4th CHAR (BINARY)

[NU] not used	[NU] not used	[NU] not used	[NU] not used

5th CHAR (BINARY)

[NU] not used	[NU] not used	1=IN PRIMARY OR SECOND-ARY MENU ITEMS	1=IN SECURE MENU ITEM

6th CHAR (BINARY)

[NU] not used	OUTA 1=ENERGIZED 0=DEENERGIZED	OUTB 1=ENERGIZED 0=DEENERGIZED	ALARM RELAY 1=ENERGIZED 0=DEENERGIZED

7th CHAR (BINARY)

*1=CHECK CALIBRATION	*1=LOOP BREAK	*1=SENSOR RATE OF CHANGE	[NU] not used

8th CHAR (BINARY)
9th CHAR (BINARY)
10th CHAR (BINARY)

[NU] not used	[NU] not used	[NU] not used	[NU] not used

NOTE: Bits marked with an "*" are error bits. Any one of these will set the "ERROR PRESENT" BIT in the "PV" PROCESS VARIABLE'S STATUS (COMMAND 00).

READ COMMAND DESCRIPTION (CONT'D)

```
COMMAND = 0100          READ "SP1 " VALUE
COMMAND = 0102          READ "SP2 " VALUE
COMMAND = 0104          READ "ALLo" VALUE
COMMAND = 0105          READ "ALHi" VALUE
COMMAND = 0124          READ "InPC" INPUT CORRECTION VALUE
COMMAND = 0116          READ "SCAL" VALUE
COMMAND = 0117          READ "SCAH" VALUE
COMMAND = 0110          READ "SPL " VALUE
COMMAND = 0111          READ "SPH " VALUE
COMMAND = 011A          READ "PEA " PEAK VALUE
COMMAND = 011B          READ "VAL " VALLEY VALUE
COMMAND = 0121          READ "CFSP" COMM FAULT SV VALUE

DATA =
      1st CHAR        SIGN  0 = POSITIVE,    (NOT 0) = NEGATIVE
      2nd CHAR        SIGN  0 = POSITIVE,    (NOT 0) = NEGATIVE

      3rd CHAR        MSD VALUE              BOTH 1st & 2nd CHARS
      4th CHAR            VALUE              MUST BE "0" FOR SIGN
      5th CHAR            VALUE              TO BE POSITIVE.
      6th CHAR        LSD VALUE

COMMAND = 0107          READ "SP1d" VALUE
COMMAND = 0108          READ "PUL1" VALUE
COMMAND = 0112          READ "S1OL" VALUE
COMMAND = 0113          READ "S1OH" VALUE
COMMAND = 010A          READ "SP2d" VALUE
COMMAND = 010B          READ "PUL2" VALUE
COMMAND = 0114          READ "S2OL" VALUE
COMMAND = 0115          READ "S2OH" VALUE
COMMAND = 010C          READ "Pb1 " VALUE
COMMAND = 010D          READ "Pb2 " VALUE
COMMAND = 010E          READ "rES " RESET VALUE
COMMAND = 010F          READ "rtE " RATE VALUE
COMMAND = 0125          READ "ArtE" VALUE
COMMAND = 0118          READ "InPt" INPUT FAULT TIMER VALUE
COMMAND = 0129          READ "SEnC" VALUE
COMMAND = 0128          READ "LPbr" VALUE
COMMAND = 011E          READ  SP1'S MANUAL VALUE
COMMAND = 012A          READ  SP2'S MANUAL VALUE
COMMAND = 0126          READ "1rt " RAMP TIME
COMMAND = 0127          READ "1St " SOAK TIME

DATA =
      1st CHAR        [NU]  not used
      2nd CHAR        [NU]  not used
      3rd CHAR        MSD VALUE
      4th CHAR            VALUE
      5th CHAR            VALUE
      6th CHAR        LSD VALUE

COMMAND = 032D          READ "dFAC" VALUE
COMMAND = 0333          READ "FiLt" VALUE
COMMAND = 032B          READ "nAt " NO ACTIVITY TIMER VALUE

DATA =
      1st CHAR        MSD VALUE
      2nd CHAR        LSD VALUE
```

READ COMMAND DESCRIPTION (CONT'D)

		DATA =	NOT 0	0	
COMMAND = 0313	READ "S1St"		dir	rE	
COMMAND = 0314	READ "S1LP"		O on	OoFF	
COMMAND = 0335	READ "SP1o"		Outb	OutA	
COMMAND = 0336	READ "S2t "		AbS	dE	
COMMAND = 0315	READ "S2St"		dir	rE	
COMMAND = 0316	READ "S2LP"		O on	OoFF	
COMMAND = 0312	READ "Strt"		YES	no	
COMMAND = 0338	READ "LErn"		Cont	End	
COMMAND = 032C	READ "rES "		AUTO	OFS	(OFS = OFFSET MODE)
COMMAND = 032E	READ "Pid2"		On	OFF	
COMMAND = 032F	READ "ArUP"		On	OFF	
COMMAND = 0317	READ "ALt "		AbS	dE	
COMMAND = 031B	READ "ALrE"		OnOF	Hold	
COMMAND = 031C	READ "ALPi"		On	OFF	
COMMAND = 033A	READ "ALiH"		On	OFF	
COMMAND = 0318	READ "ALSt"		OPEn	CLOS	
COMMAND = 0319	READ "ALLP"		O on	OoFF	
COMMAND = 0322	READ "ALbr"		On	OFF	
COMMAND = 0325	READ "OSUP"		On	OFF	(For Curr or Uolt input)
COMMAND = 0310	READ "Unit"		F	C	
COMMAND = 0328	READ "Auto"		On	OFF	(OFF = MANUAL MODE)
COMMAND = 0327	READ "PctO"		On	OFF	
COMMAND = 0330	READ "Prog"		On	OFF	
COMMAND = 0331	READ "StAt"		On	OFF	
COMMAND = 0332	READ "PEnd"		OoFF	Hold	
COMMAND = 032A	READ "LorE"		rE	LOC	
COMMAND = 0329	READ "CFLt"		2	1	COMM FAULT MODE
DATA =					
1st CHAR			NOT 0	0	BOTH 1st & 2nd
2nd CHAR			NOT 0	0	CHARS MUST BE "0"

COMMAND = 0106 **READ "CY1 "** **VALUE & "S1Ot" OUTPUT TYPE**
COMMAND = 0109 **READ "CY2 "** **VALUE & "S2Ot" OUTPUT TYPE**

DATA =
1st CHAR & 2nd CHAR
- 10 = "OnOF" ON-OFF OUTPUT
- 08 = "PUL " PULSE OUTPUT
- 04 = "Volt" VOLTAGE OUTPUT
- 02 = "Curr" CURRENT OUTPUT
- 01 = "Ft " FAST TIME PROPORTIONING OUTPUT
- 00 = "CY " TIME PROPORTIONING OUTPUT

IF OUTPUT = "CY ", THEN 3rd & 4th CHARS = CYCLE RATE VALUE
- 3rd CHAR: MSD VALUE OF CY#
- 4th CHAR: LSD VALUE OF CY#
- 5th CHAR: [NU] not used
- 6th CHAR: [NU] not used

READ COMMAND DESCRIPTION (CONT'D)

COMMAND = 011D READ SP1 or SP2 PERCENT OUTPUT VALUE

```
DATA =
      1st CHAR     0 = SP1's PCT OUT,   NOT 1 = SP2's PCT OUT
      2nd CHAR     0 = SP1's PCT OUT,   NOT 1 = SP2's PCT OUT

      3rd CHAR     [NU]  not used       BOTH 1st & 2nd CHARS
      4th CHAR     MSD VALUE            MUST BE "0" TO INDICATE
      5th CHAR        VALUE             SP1's PCT OUT
      6th CHAR     LSD VALUE
```

NOTES:

- The value in 1st, & 2nd CHAR is used to indicate that SP2's PERCENT OUTPUT VALUE is being read.
- Decimal point is implied between 5th and 6th characters (e.g., 495 = 49.5%)
- SP2's PERCENT OUTPUT will only be available if configured as a dual type instrument.
- SP1 & SP2 PERCENT OUTPUTS are alternated at a 1 second rate.

COMMAND = 0323 READ "InP" INPUT TYPE

```
DATA =
      1st CHAR     [NU]  not used
      2nd CHAR     1 = J-IC              9 = b-
                   2 = CA                A = C-
                   3 = E-                B = P392 RTD
                   4 = t-                C = n120 RTD
                   5 = L-                D = P385 RTD
                   6 = n-                E = Curr
                   7 = r-13              F = Uolt
                   8 = S-10
```

COMMAND = 0324 READ "dPt" DECIMAL POINTS

```
DATA =
      1st CHAR     [NU]  not used
      2nd CHAR     0 = NONE          2 = 0.00
                   1 =   0.0         3 = 0.000
```

COMMAND = 0326 READ "Unit" FOR CN76000 WITH CURRENT OR VOLTAGE

```
DATA =
      1st CHAR     [NU]  not used    See Command 0310
      2nd CHAR     0 = NONE          for reading T/C and RTD
                   1 = F
                   2 = C
```

COMMAND = 0334 READ "SECr" SECURITY MODE

```
DATA =
      1st CHAR     [NU]  not used
      2nd CHAR     0 = 1 AS VIEWED IN SECr
                   1 = 2 AS VIEWED IN SECr
                   2 = 3 AS VIEWED IN SECr
                   3 = 4 AS VIEWED IN SECr
```

READ COMMAND DESCRIPTION (CONT'D)

COMMAND = 0337 **READ "AL" ALARM MODE**

DATA =

1st CHAR	0 = OFF 1 = Lo 2 = Hi 3 = HiLo
2nd CHAR	[NU] not used

COMMAND = 0339 **READ "tunE" TUNE MODE**

DATA =

1st CHAR	0 = SELF 1 = Pid (FULL) 2 = SLO 3 = nor 4 = FASt
2nd CHAR	[NU] not used

WRITE COMMAND DESCRIPTION

Conventions Used

All commends appear in boldface type. Received data appears in plain type.

```
COMMAND = 0200 [DATA]    CHANGE "SP1 " VALUE
COMMAND = 0202 [DATA]    CHANGE "SP2 " VALUE
COMMAND = 0204 [DATA]    CHANGE "ALLo" VALUE
COMMAND = 0205 [DATA]    CHANGE "ALHi" VALUE
COMMAND = 020E [DATA]    CHANGE "CFSP" VALUE  (COMMUNICATION FAIL SET POINT)

DATA =
      1st CHAR          WRITE COMMAND
      2nd CHAR          WRITE COMMAND
      3rd CHAR          WRITE COMMAND
      4th CHAR          WRITE COMMAND

DATA =
      5th CHAR          MSD VALUE
      6th CHAR              VALUE
      7th CHAR              VALUE
      8th CHAR          LSD VALUE

      9th CHAR          SIGN  0 = POSITIVE,   NOT 0 = NEGATIVE
      10th CHAR         SIGN  0 = POSITIVE,   NOT 0 = NEGATIVE

                              BOTH 9th & 10th CHARS MUST BE "0"
                              FOR SIGN TO BE ACCEPTED AS POSITIVE.


COMMAND = 0206 [DATA]    CHANGE "CY1" CYCLE RATE VALUE FOR SP1
COMMAND = 0207 [DATA]    CHANGE "CY2" CYCLE RATE VALUE FOR SP2

DATA =
      1st CHAR          WRITE COMMAND
      2nd CHAR          WRITE COMMAND
      3rd CHAR          WRITE COMMAND
      4th CHAR          WRITE COMMAND

DATA =
      5th CHAR          [NU]  not used, set to 0
      6th CHAR          [NU]  not used, set to 0

      7th CHAR          MSD VALUE
      8th CHAR          LSD VALUE

      9th CHAR          [NU]  not used, set to 0
      10th CHAR         [NU]  not used, set to 0
```

NOTES:

- The CY CYCLE RATE VALUE must be an even number, between 2 and 80, i.e., 02, 04, 10, etc. Odd numbers or out of range numbers will not be accepted.
- An error response will be generated if CY CHANGE is attempted and the output type S1Ot is not set to CY.

WRITE COMMAND DESCRIPTION (CONT'D)

```
COMMAND = 0208 [DATA]   CHANGE "Pb1 " VALUE
COMMAND = 0209 [DATA]   CHANGE "Pb2 " VALUE
COMMAND = 020A [DATA]   CHANGE "rES " RESET VALUE & SET IN AUTOMATIC RESET MODE
COMMAND = 020B [DATA]   CHANGE "OFS " OFFSET VALUE & SET IN OFFSET MODE
COMMAND = 020C [DATA]   CHANGE "rtE " RATE VALUE
COMMAND = 020F [DATA]   CHANGE SP1's AUTO/MAN "MANUAL" VALUE
COMMAND = 0210 [DATA]   CHANGE SP2's AUTO/MAN "MANUAL" VALUE

DATA =
      1st CHAR          WRITE COMMAND
      2nd CHAR          WRITE COMMAND
      3rd CHAR          WRITE COMMAND
      4th CHAR          WRITE COMMAND

DATA =
      5th CHAR          MSD VALUE
      6th CHAR              VALUE
      7th CHAR              VALUE
      8th CHAR          LSD VALUE

      9th CHAR          [NU]  not used, set to 0
      10th CHAR         [NU]  not used, set to 0


COMMAND = 0403          CHANGE "tunE" MODE = SELF
COMMAND = 0404          CHANGE "tunE" MODE = Pid (FULL)
COMMAND = 0402          CHANGE  ALARM ACK
COMMAND = 0405          CHANGE "Auto" = On
COMMAND = 0406          CHANGE "Auto" = OFF (MANUAL)
COMMAND = 0407          CHANGE  PEAK RESET
COMMAND = 0408          CHANGE  VALLEY RESET
COMMAND = 040B          CHANGE "PctO" = On
COMMAND = 040C          CHANGE "PctO" = OFF
COMMAND = 0400          CHANGE "LorE" = rE  (REMOTE)
COMMAND = 0401          CHANGE "LorE" = LOC (LOCAL)
COMMAND = 040D          CHANGE  RESET "ENTER PRESSED" FLAG TO "0"

DATA =
      1st CHAR          WRITE COMMAND
      2nd CHAR          WRITE COMMAND
      3rd CHAR          WRITE COMMAND
      4th CHAR          WRITE COMMAND
```

NOTE: Data is not required for these commands. They are specific as to their function.

SECTION 3 - OPTION 4SP 4 STAGE SETPOINT

OPTION 4SP READ COMMAND DESCRIPTION

COMMAND = 00 READ "PV" PROCESS VARIABLE VALUE W/STATUS

DATA = 1st CHAR (BINARY)

AUTO ON/OFF 1=ON 0=OFF,MANUAL	COMM REM/LOC 1=REMOTE 0=LOCAL	ENTER@ CN76000 MADE 1=ENTER 0=NONE	ERROR PRESENT 1=ERROR 0=NONE,OK

2nd CHAR (BINARY)

ALARM RELAY 1=ENERGIZED 0=DEENERGIZED	NU not used	SV TYPE CFSV/LOCAL 1=CFSV 0=LOCAL	NU not used

3rd CHAR (BINARY) Option 4SP 4 Stage Set Point Active Set Point

NU not used	NU not used	0 0 1 1	0 1 0 1	= 1SP1 = 2SP1 = 3SP1 = 4SP1

4th CHAR (BINARY)

NU not used	NU not used	NO ACTIVITY TIMER nAt 1=TIMEOUT 0=NORMAL,OK	PV SIGN NEG/POS 1=NEGATIVE 0=POSITIVE

5th CHAR MSD PROCESS VARIABLE VALUE
6th CHAR PROCESS VARIABLE VALUE
7th CHAR PROCESS VARIABLE VALUE
8th CHAR LSD PROCESS VARIABLE VALUE

NOTE: If ERROR PRESENT BIT = "1", issuing a FULL STATUS READ COMMAND "05" can be used to determine the specific error.

OPTION 4SP READ AND WRITE COMMAND SUMMARY

READ COMMANDS	WRITE COMMANDS
	00 = Positive Value FF= Negative Value
01 00 1SP1 VALUE	02 00 1SP1 VALUE XX
01 01 2SP1 VALUE	02 01 2SP1 VALUE XX
01 2D 3SP1 VALUE	02 11 3SP1 VALUE XX
01 2E 4SP1 VALUE	02 12 4SP1 VALUE XX
03 39 1tun SELF/Pid/SLO/nor/FASt	04 03 1tun MODE = SELF
03 3B 2tun SELF/Pid/SLO/nor/FASt	04 0E 2tun MODE = SELF
03 3C 3tun SELF/Pid/SLO/nor/FASt	04 0F 3tun MODE = SELF
03 3D 4tun SELF/Pid/SLO/nor/FASt	04 10 4tun MODE = SELF
	04 04 1tun MODE = FULL Pid
	04 11 2tun MODE = FULL Pid
	04 12 3tun MODE = FULL Pid
	04 13 4tun MODE = FULL Pid
03 12 Strt.YES/no 1SP1	———
03 3E Strt YES/no 2SP1	———
03 3F Strt YES/no 3SP1	———
03 40 Strt YES/no 4SP1	———
03 38 LErn Cont/End 1SP1	———
03 41 LErn Cont/End 2SP1	———
03 42 LErn Cont/End 3SP1	———
03 43 LErn Cont/End 4SP1	———
03 2D dFAC VALUE 1SP1	———
03 44 dFAC VALUE 2SP1	———
03 45 dFAC VALUE 3SP1	———
03 46 dFAC VALUE 4SP1	———
01 0C 1Pb1 VALUE	02 08 1Pb1 VALUE
01 2F 2Pb1 VALUE	02 13 2Pb1 VALUE
01 30 3Pb1 VALUE	02 14 3Pb1 VALUE
01 31 4Pb1 VALUE	02 15 4Pb1 VALUE
03 2C 1rES RESET AUTO/OFS MODE	02 0A 1rES VALUE AUTO MODE
03 47 2rES RESET AUTO/OFS MODE	02 16 2rES VALUE AUTO MODE
03 48 3rES RESET AUTO/OFS MODE	02 17 3rES VALUE AUTO MODE
03 49 4rES RESET AUTO/OFS MODE	02 18 4rES VALUE AUTO MODE
01 0E 1rES RESET VALUE	02 0B 1OFS VALUE OFFSET MODE
01 32 2rES RESET VALUE	02 19 2OFS VALUE OFFSET MODE
01 33 3rES RESET VALUE	02 1A 3OFS VALUE OFFSET MODE
01 34 4rES RESET VALUE	02 1B 4OFS VALUE OFFSET MODE
01 0F 1rtE RATE VALUE	02 0C 1rtE RATE VALUE
01 35 2rtE RATE VALUE	02 1C 2rtE RATE VALUE
01 36 3rtE RATE VALUE	02 1D 3rtE RATE VALUE
01 37 4rtE RATE VALUE	02 1E 4rtE RATE VALUE
03 4A SP 1/2/3/4 #SP1	04 14 SP = 1SP1
	04 15 SP = 2SP1
	04 16 SP = 3SP1
	04 17 SP = 4SP1
03 4B SPSA rE/Int	———

OPTION 4SP READ COMMAND DESCRIPTION

Conventions Used

All commends appear in boldface type. Received data appears in plain type.

COMMAND = 0100 **READ "1SP1" VALUE**
COMMAND = 0101 **READ "2SP1" VALUE**
COMMAND = 012D **READ "3SP1" VALUE**
COMMAND = 012E **READ "4SP1" VALUE**

```
DATA =  1st CHAR        SIGN  0 = POSITIVE,    (NOT 0) = NEGATIVE
        2nd CHAR        SIGN  0 = POSITIVE,    (NOT 0) = NEGATIVE
        3rd CHAR        MSD VALUE              BOTH 1st & 2nd CHARS
        4th CHAR            VALUE              MUST BE "0" FOR SIGN
        5th CHAR            VALUE              TO BE POSITIVE.
        6th CHAR        LSD VALUE
```

COMMAND = 010C **READ "1Pb1" VALUE under 1SP1**
COMMAND = 012F **READ "2Pb1" VALUE under 2SP1**
COMMAND = 0130 **READ "3Pb1" VALUE under 3SP1**
COMMAND = 0131 **READ "4Pb1" VALUE under 4SP1**

COMMAND = 010E **READ "1rES" RESET VALUE under 1SP1**
COMMAND = 0132 **READ "2rES" RESET VALUE under 2SP1**
COMMAND = 0133 **READ "3rES" RESET VALUE under 3SP1**
COMMAND = 0134 **READ "4rES" RESET VALUE under 4SP1**

COMMAND = 010F **READ "1rtE" RATE VALUE under 1SP1**
COMMAND = 0135 **READ "2rtE" RATE VALUE under 2SP1**
COMMAND = 0136 **READ "3rtE" RATE VALUE under 3SP1**
COMMAND = 0137 **READ "4rtE" RATE VALUE under 4SP1**

```
DATA =  1st CHAR        NU  not used
        2nd CHAR        NU  not used
        3rd CHAR        MSD VALUE
        4th CHAR            VALUE
        5th CHAR            VALUE
        6th CHAR        LSD VALUE
```

COMMAND = 032D **READ "dFAC" VALUE under 1SP1**
COMMAND = 0344 **READ "dFAC" VALUE under 2SP1**
COMMAND = 0345 **READ "dFAC" VALUE under 3SP1**
COMMAND = 0346 **READ "dFAC" VALUE under 4SP1**

```
DATA =  1st CHAR        MSD VALUE
        2nd CHAR        LSD VALUE
```

COMMAND = 0339 **READ "1tun" TUNE MODE under 1SP1**
COMMAND = 033B **READ "2tun" TUNE MODE under 2SP1**
COMMAND = 033C **READ "3tun" TUNE MODE under 3SP1**
COMMAND = 033D **READ "4tun" TUNE MODE under 4SP1**

```
DATA =  1st CHAR        0 = SELF
                        1 = Pid (FULL)
                        2 = SLO
                        3 = nor
                        4 = FASt
        2nd CHAR        NU  not used
```

OPTION 4SP READ COMMAND DESCRIPTION (CONT'D)

		NOT 0	0	
COMMAND = 0312	READ "Strt"	YES	no	under 1SP1
COMMAND = 033E	READ "Strt"	YES	no	under 2SP1
COMMAND = 033F	READ "Strt"	YES	no	under 3SP1
COMMAND = 0340	READ "Strt"	YES	no	under 4SP1
COMMAND = 0338	READ "LErn"	Cont	End	under 1SP1
COMMAND = 0341	READ "LErn"	Cont	End	under 2SP1
COMMAND = 0342	READ "LErn"	Cont	End	under 3SP1
COMMAND = 0343	READ "LErn"	Cont	End	under 4SP1
COMMAND = 032C	READ "1rES"	AUTO	OFS	under 1SP1
COMMAND = 0347	READ "2rES"	AUTO	OFS	under 2SP1
COMMAND = 0348	READ "3rES"	AUTO	OFS	under 3SP1
COMMAND = 0349	READ "4rES"	AUTO	OFS	under 4SP1 OFS=OFFSET MODE
COMMAND = 034B	READ "SPSA"	rE	Int	Option 485 forces 4SP SPSA=Int Menu is not affected
DATA = 1st CHAR		NOT 1	0	BOTH 1st & 2nd
2nd CHAR		NOT 1	0	CHARS MUST BE "0"

COMMAND = 034A **READ "SP " CURRENT SET POINT SELECTION**

DATA = 1st CHAR NU not used
2nd CHAR 0 = 1SP1 IS CURRENTLY SELECTED
1 = 2SP1 IS CURRENTLY SELECTED
2 = 3SP1 IS CURRENTLY SELECTED
3 = 4SP1 IS CURRENTLY SELECTED

OPTION 4SP WRITE COMMAND DESCRIPTION

Conventions Used

All commends appear in boldface type. Received data appears in plain type.

```
COMMAND = 0200 [DATA]   CHANGE "1SP1" VALUE
COMMAND = 0201 [DATA]   CHANGE "2SP1" VALUE
COMMAND = 0211 [DATA]   CHANGE "3SP1" VALUE
COMMAND = 0212 [DATA]   CHANGE "4SP1" VALUE

        1st CHAR        WRITE COMMAND
        2nd CHAR        WRITE COMMAND
        3rd CHAR        WRITE COMMAND
        4th CHAR        WRITE COMMAND

DATA =  5th CHAR        MSD VALUE
        6th CHAR            VALUE
        7th CHAR            VALUE
        8th CHAR        LSD VALUE
        9th CHAR        SIGN  0 = POSITIVE,   NOT 1 = NEGATIVE
        10th CHAR       SIGN  0 = POSITIVE,   NOT 1 = NEGATIVE

                        BOTH 9th & 10th CHARS MUST BE "0"
                        FOR SIGN TO BE ACCEPTED AS POSITIVE.


COMMAND = 0208 [DATA]   CHANGE "1Pb1" VALUE under 1SP1
COMMAND = 0213 [DATA]   CHANGE "2Pb1" VALUE under 2SP1
COMMAND = 0214 [DATA]   CHANGE "3Pb1" VALUE under 3SP1
COMMAND = 0215 [DATA]   CHANGE "4Pb1" VALUE under 4SP1

                                      RESET VALUE & SET IN AUTO MODE
COMMAND = 020A [DATA]   CHANGE "1rES" RESET VALUE IN AUTO under 1SP1
COMMAND = 0216 [DATA]   CHANGE "2rES" RESET VALUE IN AUTO under 2SP1
COMMAND = 0217 [DATA]   CHANGE "3rES" RESET VALUE IN AUTO under 3SP1
COMMAND = 0218 [DATA]   CHANGE "4rES" RESET VALUE IN AUTO under 4SP1

                                      OFFSET VALUE & SET IN OFFSET MODE
COMMAND = 020B [DATA]   CHANGE "1OFS" OFFSET VALUE IN OFS under 1SP1
COMMAND = 0219 [DATA]   CHANGE "2OFS" OFFSET VALUE IN OFS under 2SP1
COMMAND = 021A [DATA]   CHANGE "3OFS" OFFSET VALUE IN OFS under 3SP1
COMMAND = 021B [DATA]   CHANGE "4OFS" OFFSET VALUE IN OFS under 4SP1

COMMAND = 020C [DATA]   CHANGE "1rtE" RATE VALUE under 1SP1
COMMAND = 021C [DATA]   CHANGE "2rtE" RATE VALUE under 2SP1
COMMAND = 021D [DATA]   CHANGE "3rtE" RATE VALUE under 3SP1
COMMAND = 021E [DATA]   CHANGE "4rtE" RATE VALUE under 4SP1

        1st CHAR        WRITE COMMAND
        2nd CHAR        WRITE COMMAND
        3rd CHAR        WRITE COMMAND
        4th CHAR        WRITE COMMAND

DATA =  5th CHAR        MSD VALUE
        6th CHAR            VALUE
        7th CHAR            VALUE
        8th CHAR        LSD VALUE

        9th CHAR        NU  not used, set to 0
        10th CHAR       NU  not used, set to 0
```

OPTION 4SP WRITE COMMAND DESCRIPTION

```
COMMAND = 0403          CHANGE "1tun" MODE = SELF under 1SP1
COMMAND = 040E          CHANGE "2tun" MODE = SELF under 2SP1
COMMAND = 040F          CHANGE "3tun" MODE = SELF under 3SP1
COMMAND = 0410          CHANGE "4tun" MODE = SELF under 4SP1

COMMAND = 0404          CHANGE "1tun" MODE = Pid (FULL) under 1SP1
COMMAND = 0411          CHANGE "2tun" MODE = Pid (FULL) under 2SP1
COMMAND = 0412          CHANGE "3tun" MODE = Pid (FULL) under 3SP1
COMMAND = 0413          CHANGE "4tun" MODE = Pid (FULL) under 4SP1

COMMAND = 0414          CHANGE "SP  " CURRENT SET POINT = 1SP1
COMMAND = 0415          CHANGE "SP  " CURRENT SET POINT = 2SP1
COMMAND = 0416          CHANGE "SP  " CURRENT SET POINT = 3SP1
COMMAND = 0417          CHANGE "SP  " CURRENT SET POINT = 4SP1

        1st CHAR        WRITE COMMAND
        2nd CHAR        WRITE COMMAND
        3rd CHAR        WRITE COMMAND
        4th CHAR        WRITE COMMAND
```

NOTE: Data is not required for these commands. They are specific as to their function.

SECTION 4 - SAMPLE PROGRAMS

SAMPLE PROGRAM #1

PROGRAM USING THE OMEGA A1000 RS-232/RS-485 CONVERTER

```
10 CLS:KEY OFF                          'CLEAR SCREEN AND SOFT KEYS
30 KEY 1,""
40 LOCATE 25,30
50 PRINT "<<STRIKE F1 KEY TO EXIT>>"        'EXIT INSTRUCTIONS
60 LOCATE 1,1,1                             'HOME CURSOR
70 ON KEY (1)  GOSUB 240
80 KEY (1)  ON
90 OPEN "com1:9600,n,8,1,rs,cs,cd,ds" AS #1     "OPEN COM PORT
100 INPUT " ADDRESS OF THE CN76000:";AD$
110 INPUT " ENTER COMMAND AND DATA WITH NO SPACES";CMD$
120 TEX$ = AD$ +CMD$                        'COMBINE ADDRESS AND COMMAND STRING
130 GOSUB 270
140 TEX$ = CHR$(2) + "L" + TEX$ + CS$+ CHR$(3) + CHR$(0):RE$="" :CAR$=""
150 PRINT  #1, TEX$
160 REM GET RESPONSE FROM CN76000
170 CAR$ = INPUT$(1,#1)
180 RE$ = RE$ + CAR$
190 IF CAR$ <> CHR$(6) THEN GOTO 170
200 REM PRINT RESPONSE FROM CN76000
210 PRINT:PRINT " ADDRESS  "; AD$
220 PRINT " THE RESPONSE IS ";RE$:PRINT:PRINT
230 GOSUB 100
240 CLOSE #1
250 END
260 REM CALCULATE CHECKSUM VALUE
270 LN = LEN(TEX$) :S=0
280 FOR I = 1 TO LN : B = (ASC(MID$(TEX$,I,1))):S =S+B:NEXT I
290 CS$ = RIGHT$(HEX$(S) ,2)
300 RETURN
```

SAMPLE PROGRAM #2

PROGRAM TO COMMUNICATE WITH AN OMEGA CN76000 SERIES CONTROLLER

```
10 REM OMEGACOM.BAS
20 REM Program to communicate with an OMEGA CN76000 Series Control
30 Written in BASIC for IBM PC or compatible computer
40 Assume that control is set up for address 32, at 9600 baud

100 CLS
110 OPEN "com1: 9600,N,8,1,cs" FOR RANDOM AS #1: REM open port 1, 9600 baud
120 RTS% = INP(&H3FC):          REM  )  Set up variables
130 RTSR% = RTS% AND &HFD:      REM  )  for comm direction
140 RTST% = RTS% OR &H2:        REM  )  control
150 STX$ = CHR$(2) :  REM start transmission character
160 ETX$ = CHR$(3) :  REM end transmission character
170 ACK$ = CHR$(6) :  REM acknowledge character
180 NUL$ = CHR$(0) :  REM null character

200 TXCMD$ = STX$ + "L32" + "00" + "C5" + ETX$ + NUL$:  REM L32 = control
address
210 REM                                                        00 = read command
220 REM                                                        C5 = checksum
300 PRINT TXCMD$; SPC(10);
400 GOSUB 1000: REM transmit / receive subroutine
500 PRINT RXDATA$
600 KY$ = INKEY$
700 CLOSE #1
800 END

1000 TMO% = 0: REM Set up time out counter
1010 RXDATA$ = "":  REM Clear receive buffer

2000 OUT &H3FC, RTST%: REM set RTS line
2010 PRINT #1, TXCMD$; : REM Send data packet.  Don't forget semicolon!
2020 IF (INP(&H3FD) AND &H60) <> &H60 THEN GOTO 2020:  REM wait until xmit
buffer
2030 REM                                                       is empty
3000 OUT &H3FC, RTSR%:  REM reset RTS line
3010 IF LOC(1) = 0 THEN GOTO 3050: REM if receive buffer empty skip read
3020 RX$ = INPUT$(1, #1): REM fetch character
3030 RXDATA$ = RXDATA$ + RX$: REM Add to the end
3040 IF INSTR(1, RX$, ACK$) > 0 THEN GOTO 3080: REM End of RX packet?
3050 TMO% = TMO% + 1: REM time out counter
3060 IF TMO% < 2500 THEN GOTO 3010
3070 RXDATA$ = "Time Out"
3080 RETURN
```

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OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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