Pro-Lite, Inc.
Basic Protocol for Pro-Lite ASCII-Series Version 6.00

Introduction

In order to make these capabilities as simple as possible, more user friendly, a new and easy protocol with straight ASCII has been developed. This manual is designed to provide full protocol information for users who want to write their own user interface program to communicate with Pro-Lite ASCII based electronic moving message signs.

Structure of Protocol:

<IDxx><Pn>...*TEXT DATA/COMMAND..* [cr][lf]

Where:

<IDxx> Packet header also serves as destination Sign identifier

<, >	are ASCII code 3C, 3D
ID	are character "I" & "D" (must be in Upper case)
xx	are the Hex numbers 00 to FF in ASCII format i.e.

00 =	Global Call (to all Signs)
01 =	display unit 1
0A =	display unit 10
10 =	display unit 16
FF =	display unit 255

Hexadecimal to Decimal table for ID conversion

```
    0   1   2  3  4   5  6  7  8  9   A  B   C  D  E   F
 -|---------------------------------------------------------------
0| XX  01  02 03 04  05 06 07 08 09  10 11  12 13 14  15
1| 16  17  18 19 20  21 22 23 24 25  26 27  28 29 30  31
2| 32  33  34 35 36  37 38 39 40 41  42 43  44 45 46  47
3| 48  49  50 51 52  53 54 55 56 57  58 59  60 61 62  63
```

<Pn> specifies which page this message will go to :

There are 26 pages (A-Z) available in the TruColorII Series. Each page can include text, graphics, Time, Date and other commands like color, scroll up and scroll down, etc.

<, **P**, **>**	ASCII character "<" "P" & ">" respectively
n	Page number in ASCII character, i.e.

A	=	Page A
B	=	Page B
:		:
:		:
Y	=	Page Y
Z	=	Page Z

...*TEXT DATA/COMMAND...*

Packet body either Text Data or Commands
(refer to Message Data & Command for details)

[cr][lf]   Packet end with Character Return and Line Feed

                [cr]   = ASCII code 0D
                [lf]   = ASCII code 0A

Response feature from display:

<IDXX><CheckCode>[cr][lf]

<CheckCode>   S = Successful transmission
                       E = Error
                       F = Buffer Full

Sample Transmission w/ response:

To Display:

<ID01><PA>This is a test message[cr][lf]

From Display:

<ID01>S

(A) Message Data:

This is the actual part of the message that includes the message itself and information on the colors, the fonts, the sizes, the functions such as scroll up, scroll down, Time, Date etc.

Text message:

ASCII characters: Accepts free format text, i.e. any character and symbols
(96 ASCII printable characters 20H - 7FH).

European characters:64 European characters are provided for multi-nation language
applications.

<E0>	=	μ
:		**:**
<EA>	=	o

*For the complete European Assignment Table, refer to **APPENDIX A**

Graphic Blocks: There are 26 built in graphics that are user programmable.

<BA> Graphic A

:

<BZ> Graphic Z

*For the complete Graphics Assignment Table, refer to **APPENDIX B**

Color information:

There are 26 selectable color combinations.
To define a color to use for your message, a *color attribute* such as **<CA>** must be placed before the text information. The color will remain fixed until another *color attribute* is inserted.

<CA>	Low Red
<CB>	Mid Red
<CC>	High Red
:	

*The default color is **<CP>** (Rainbow Color).
*For the complete Color Assignment Table, refer to **APPENDIX C**

Character Font:

There are 8 selectable character fonts.
To define a character font to use for your message, a *font attribute* such as **<SA>** must be placed before the text information. The font will remain fixed until another *font attribute* is inserted.

<SA>	Normal size
<SB>	Double size
:	**:**
<SH>	

*The default character font is **<SA>** (Normal Size).
*For the complete Character Font Table, refer to **APPENDIX D**

Character Size:

There are 2 selectable character sizes (5X7 or 4X7). To define a character size to use for your message, a *character size attribute* such as **<SI>** must be placed before the text information. The size will remain fixed until another *size attribute* is inserted.

<SI>	5X7 font size
<SJ>	4X7 font size

*The default character size is **<SI>** (5X7).

Display functions:

There are 26 display functions such as Scroll up, Scroll down, Animations, Time, Date, Link Page, etc. There are two types of display functions:
  (1)leading commands - how the word will appear
  (2)tail commands - how the word will disappear
A leading command, for example "SCROLL UP", must be placed before the text.
A tail command, for example "CLOSE →←", must be placed after the text.
To define which display function to use, a *function attribute* must be used.

<FA>	Auto Function
<FB>	Open ←→
:	

*The default function is **<FS>** (Shift Left).
*For the complete Display Function Table, refer to **APPENDIX E**

(B) User alterable Graphic Block:

There are 26 user alterable graphic blocks (A-Z) available, the basic format is as follow:

<IDxx><Gx>...CCC..[cr][lf]

Where:

<, **G** & **>** = ASCII characters "<","G" & ">"
x = Block graphic number in ONE ASCII character (A - Z)
...CCC.. = Bit pattern(with color) information of the graphic block is in fix length of 126 bytes i.e. 18 dots by 7 rows, where upper left dot is the first byte and the lower right is the last(126th) byte. The whole graphic block update will be ignored if any length exceeds the 126 bytes. For each byte it can either be "**R**" (red), "**G**" (green), "**Y**" (yellow) or "**B**" (black). Any characters other than "R","G","Y" & "B" are treated as Black.

Example: Updating graphic block Y with 1 & 2 rows in red, 3,4 & 5 rows in yellow, 6 & 7 rows in green.

<ID01><GY>RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRYYYYYYYYY YYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYGGGGGGGGGGGG GGGGGGGGGGGGGGGGGGGGGGGGGG[cr][lf]

(C) Commands:

1) Delete Page(s):
    <IDxx><DPn>[cr][lf]

<, D, P, >	ASCII characters "<","D","P" & ">"
n	Page number in ASCII character (A – Z, *)

        <DP*> =   Delete All pages
        <DPA>=   Delete page A
                    :
        <DPZ>=   Delete page Z

2) Delete Graphic block(s):
    <IDxx><DGn>[cr][lf]

<, D, G, >	ASCII characters "<","D","G" & ">"
n	Graphic block number in ASCII character (A – Z, *)

        <DG*> =   Delete All graphics
        <DGA>=   Delete graphic block A
                    :
        <DGZ>   =   Delete graphic block Z

3) Delete ALL:
    This command will delete all Page(s), and restore all default Graphic Blocks.
    <IDxx><D*>[cr][lf]

<, D, *, >	ASCII characters "<","D","*" & ">"

4) Run Page Now
    <IDxx><RPn>[cr][lf]

<, R, P, >	ASCII characters "<","R","P" & ">"
n	Page number in ASCII character (A – Z, *)

        <RP*> =   Restart
        <RPA>=   Run page A
                   :
        <RPZ>=   Run page Z

5) Run a page for nn Time and default to another Page
    <RPx><nn><RPy>[cr][lf]

<, R, P, >	ASCII characters "<","R","P" & ">"
x, y	Page number in ASCII character (A - Z)
<nn>	Where nn represents number of times (01-99)

    *The <RPy> will run Page y after Page x runs for nn times.

6) Sign information (i.e. Baud Rate, ID, Version)

    <IDxx><?>[cr][lf]

7) Resetting the sign to factory default settings

    <IDxx><RST>

8) Set sign SHIFT SPEED

<IDxx><SPDy>[cr][lf]

<, S, P, D, >	ASCII characters "<","I","D" & ">"
y	Letter in ASCII character (A - Z)
	A = fastest; Z = slowest

9) SETTING INTERNAL TIME CLOCK

This is a special command to sync. or set the relative/real time clock of the display unit(s) and it is the only GLOBAL command in this set of protocol. The format as shown below:

<TCCYYMMDDWhhmmssH>[cr][lf]

<, T, >	ASCII "<", "T" & ">"
CC	Century (19 = 19TH Century; 20 = 20TH Century)
YY	Year (00 - 99)
MM	Month (01 - 12)
DD	Day (01 - 31)
W	Day of week (0 - 6)
hh	Hour (in 24 hour format, 00 - 23)
mm	Minute (00 - 59)
ss	Second (00 - 59)
H	"0" = 12 hr display mode; "1" = 24 hr display mode

9) Target Count Up

This command will define the current, target value, and target page to run when the target value is reached.

<UaccccttttP>[cr][lf]

<, U, >	ASCII "<", "U" & ">"
a	"D" for Day and "H" for Hour
cccc	Start Value
	(i.e. start count in 0001 days/hrs, 0002 days/hrs, etc)
tttt	Target Value
	(i.e. target in 0001 days/hrs, 0002 days/hrs, etc)
P	Run page P (A - Z) when the target value is reached.

10) Time Count Down

This command will define the target value of Days, Hours, Minutes and run counting all time values down to zero.

<VddddhhmmP>[cr][lf]

<, V, >	ASCII "<", "V" & ">"
dddd	Days set to count down (0001 - 9999)
hh	Hours set to count down (01 – 59)
mm	Minutes set to count down (01 –59)
P	Run page P (A - Z) when count down value reaches 0.

APPENDIX A   <u>European Table</u>

EO	{	**EB**	Ι	**ET**	[	**Eg**	φ		
E1	=	**EC**	Κ	**EU**	]	**Eh**	ϕ		
E2	;	**ED**	Ο	**EV**	α	**Ei**	η		
E3	Α	**EE**	Μ	**EW**	_	**Ej**	κ		
E4	?	**EF**	ϑ	**EX**	σ	**Ek**	υ		
E5	Χ	**EG**	Λ	**EY**	θ	**El**	λ		
E6	Ε	**EH**	Π	**EZ**	∴	**Em**	ϖ		
E7	ν	**EI**	Ν	**E[**	⊥	**En**	⇐		
E8	>	**EJ**	≥	**E**	β	**Eo**	f		
E9	<	**EK**	Ω	**E]**		**Ep**	⊥		
E:	Β	**EL**	Σ	**E^**	τ	**Eq**	−		
E;	≅	**EM**	Υ	**E _**	ρ	**Er**	□		
E<	Δ	**EN**	Ρ	**Ea**	ζ	**Es**	8		
E=	Φ	**EO**	Ξ	**Eb**	χ	**Et**	κ		
E>	8	**EP**	Τ	**Ec**	ι	**Eu**	ρ		
E?	Γ	**EQ**	ς	**Ed**	ε	**Ev**	3		
E@	Η	**ER**	א	**Ee**	γ	**Ew**	Σ		
EA	o	**ES**	ℑ	**Ef**	δ				

APPENDIX B   <u>Graphics Table</u>

BA	Telephone	**BN**	Duck
BB	Glasses	**BO**	Motorcycle
BC	Faucet	**BP**	Bicycle
BD	Rocket	**BQ**	Crown
BE	Space monster	**BR**	Twin Hearts
BF	Key	**BS**	Arrow →
BG	Shirt	**BT**	Arrow ←
BH	Helicopter	**BU**	Arrow ↙
BI	Car	**BV**	Arrow ↖
BJ	Tank	**BW**	Glass of beer
BK	House	**BX**	Chair
BL	Tea pot	**BY**	High-heel shoe
BM	Knife & fork	**BZ**	Wine glass

APPENDIX C   <u>Color Table</u>

CA	Dim RED	**CJ**	Dim LIME	**CS**	GRN/RED 3D
CB	RED	**CK**	Bright LIME	**CT**	GRN/YEL 3D
CC	Bright RED	**CL**	Bright GREEN	**CU**	GRN on RED
CD	ORANGE	**CM**	GREEN	**CV**	RED on GRN
CE	Bright ORANGE	**CN**	Dim GREEN	**CW**	ORG on GRN 3D
CF	Light YELLOW	**CO**	YEL/GRN/RED	**CX**	LIME on RED 3D
CG	YELLOW	**CP**	RAINBOW	**CY**	GRN on RED 3D
CH	Bright YELLOW	**CQ**	RED/GRN 3D	**CZ**	RED on GRN 3D
CI	LIME	**CR**	RED/YEL 3D		

APPENDIX D   <u>Font Table</u>

SA	Normal	**SB**	Bold	**SC**	Italic
SD	Bold Italic	**SE**	Flash Normal	**SF**	Flash Bold
SG	Flash Italic	**SH**	Flash Bold Italic		

APPENDIX E   <u>Function   Table</u>

FA	AUTO	**FB**	OPEN ←→	**FC**	COVER ←→
FD	DATE	**FE**	CYCLING	**FF**	CLOSE ←
FG	CLOSE →	**FH**	CLOSE →←	**FI**	SCROLL UP
FJ	SCROLL DOWN	**FK**	OVERLAP	**FL**	STACKING
FM	COMIC 1	**FN**	COMIC 2	**FO**	BEEP
FP	PAUSE	**FQ**	APPEAR	**FR**	RANDOM
FS	SHIFT ←	**FT**	TIME	**FU**	MAGIC
FV	THANK YOU	**FW**	WELCOME	**FX**	(N/A)
FY	(N/A)	**FZ**	LINK PAGE	**F1**	TARGET
F2	CURRENT	**F3**	DAY LEFT	**F4**	HOUR LEFT
F5	MINUTE LEFT	**F6**	SECOND LEFT		

Wiring Assignments for Series II

DB9 Female Connector
To IBM PC Com1 or Com2

TruColorII
RJ12 Connector

2   Rx   GND

      Tx

3   Tx   Rx

      GND

5   GND