i

InfoSight
KE28XX
INFOTAG®
MARKER

OPERATIONS and
MAINTENANCE MANUAL

KE2800, KE2852, KE2856, KE2853, KE2854

Revision E
June 2000

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PREFACE

      This manual is a quick start compilation of the KE28XX Laser Marker data. The manual is laid out into sections, with each section containing approximately the same technical level of use. The following is a list of the different sections of the manual and their suggested uses:

TABLE OF CONTENTS

CHAPTER 1
SYSTEM STARTUP

The KE28XX requires   220VAC 5A 50/60Hz or 110VAC 10A 50/60Hz according to job
                             Number (Legend plate on marker)
                             Power supply cord must be permanently connected due to high
                             leakage current of greater than 3.5mA.
                             Unit must be connected to a branch circuit with a dedicated
                             circuit breaker.

UK Deviation:
      Cores in this main are colored in accordance with the following code:
      Green and yellow: earth, Blue: neutral, brown: live.

The Terminal is attached to the top DB-25 connector on the back side of the marker using
the supplied cable. A terminal or terminal program is required. The Terminal settings
should be:

Emulation	--	VT220
Keyboard Type	--	108
Main Port Speed	--	19200
Data Width	--	8
Parity	--	None
Stop	--	1
Transmit Flow Control	--	X-ON / X-OFF
Receive Flow Control	--	X-ON / X-OFF
Host Interface	--	RS232

If a terminal was supplied with the KE28xx to enter or exit the terminal settings screen press
SHIFT-F3. To check correct settings on the terminal, power on the marker by switching the
key switch located on front panel to the ON position. The software contained within the
marker should present the user with a bordered windowed screen.

The KE28XX should be positioned at least a foot away from the wall to allow room for the
ventilation. The three inch ventilation hose should be attached to the top of the marker to
remove residue from the marking area and should be discharged outside the pulpit area.

The KE28XX LASER MARKER should be placed in a temperature controlled environment.
This marker, though designed for steel mill use, should be treated as any typical computer
system and printer.

CHAPTER 2
SEQUENCE OF OPERATIONS

2.1 Installing New Tags

Installing a new roll of tags is as easy as mounting the new roll atop the platform to the left of
the marker and feeding by hand the tip of the tag stock, pushing it into first roller until it stops
"the drive roller". Once reaching the drive roller the operator then presses the orange feed tag
light.

Reminder - The marker is not ready for use until the laser E-stop is RESET by pressing the
orange reset button .

2.2 Printing A Tag

Note - The following assumes the KE28XX marker has already been set up with your particular tag layout.

The KE28XX marker can be used as a stand alone marker or can be downloaded via RS232 data communications. For demonstration purposes, we will assume the marker will be used as a stand alone marker.

Tags can only be printed from two screens on the marker; the MAIN SCREEN, and the OPERATOR SCREEN. At each of these screens, simply press the PRINT button located on the front panel. DO NOT hold the PRINT button in for more than 3 seconds. The Laser Marker is set up to perform a "TEST PRINT" when the PRINT button is depressed for more than 3 seconds.

2.21 Printing From The Operator Screen

The OPERATOR SCREEN is a supervisor selectable screen. When the laser marker is powered ON, the OPERATOR SCREEN is the screen that is displayed if this option is turned on by the supervisor.

The OPERATOR SCREEN can be customized with up to ten prompted fields. At each prompt the operator types in the required data and presses RETURN or ENTER. If the supervisor has set up verification parameters, the data will be checked for accuracy before the next field can be entered. If the information is entered incorrectly (i.e. an alpha character where a numeric is supposed to be), an error message appears and prompts the operator to re-enter the information in the correct format. Once the correct data has been entered, the OPERATOR should press the PRINT button on the front control panel. A typical 6" tag will take about 20 -30 seconds, depending on model, to print. After printing the tag is fed through the presentation slot for easy break off at the nick of the tag.

2.22 Printing From The Main Screen

The MAIN SCREEN is the factory default screen. The MAIN SCREEN contains the pull down menus available for tag editing and laser marker setup. This screen is displayed when the marker is powered ON if the OPERATOR SCREEN is disabled.

The MAIN SCREEN can be customized with the same prompted fields as the OPERATOR SCREEN. At each prompt, type the desired information and press RETURN or ENTER. Once the correct information has been entered, press the PRINT button on the front control panel to print a tag. Printing can also be accomplished by using the pull-down menu (top of screen) MARKER. Simply choose PRINT from the MARKER pull-down menu to print the desired information typed. The printed tag will be presented to the operator through the presentation slot for easy break off at the nick of the tag.

2.3 KE28XX Screens

The KE28XX is equipped for easy supervisor flexibility and contains many pull down screens and menus. To move quickly and easily through these screens, the software has been designed with quick keys. The quick key letters are highlighted on each screen. To use the quick keys, simply press CTRL-(highlighted letter). You can also use the arrow keypad or the TAB key to move within each window.

2.31 Main Screen

```
==================[ InfoSight Corporation – InfoTag Marking System ]==============

    General    Tag         Marker     Setup       Monitor

 SYSTEM
            ====== Current Message ======           ====== Status ======
        Assignment : 2                           MODE      : ??
                                                  STATE     : IDLE

                                                  TAGS LEFT  : 267

                                                  QTY REQ.  : [6        ]
                                                  COUNT     :   6

                                                  START NO:    [496749   ]
                                                  S/N Lower : [1        ]
                                                  S/N Upper : [999999   ]


         Print Batch              Pause
```

The MAIN SCREEN is the factory default screen. When the laser marker is powered ON, this screen will appear. Only certain menus and fields are accessible unless the supervisor password has been entered. The MAIN SCREEN has 5 pull-down menus available at the top of the screen; GENERAL, TAG, MARKER, SETUP, MONITOR. The following is a brief description of each menu and what they contain:

    1) GENERAL -
            ABOUT - About the KE28XX Marker.
            SUPERVISOR - Allows password access to EDIT SCREENS.
            OPERATOR - To return to OPERATOR SCREEN.
            REDISPLAY - Redisplays the screen should the screen become corrupted.
    2) TAG -
            ASSIGN - Change assignment buffers (10 tag layouts available)
            EDIT - Allows you to edit the tag layout and OPERATOR SCREEN.
    3) MARKER -
            ON-LINE - Brings the marker on-line/off-line from the screen.
            PRINT - Allows user to print from the screen.
            FEED A TAG - Allows user to feed tags from screen.
    4) SET UP -

MARKER - Set: tag width/length, tags per roll, heat of laser, half laser active.
COMM PORT - Set: baud rate, bits, stop, parity.
HOST - Set: protocol, offsets and lengths.
UNITS - English or metric
SUPER PASSWORD - Allows user to set the supervisor password.
EDIT PASSWORD - Allows to edit supervisor password.
USER TABLE - Allows set up of shift, day, month, or year, audit tracking.
TIME/DATE - Sets time and date.
DEFAULTS - DO NOT USE. Sets system defaults.
5) MONITOR - Field service use only!

2.32 Edit Screen

```
════════════[ InfoSight Corporation – InfoTag Marking System ]════════════
║                          ════[ Tag Editor ]════                          ║
║   Buffer Number   : [2    ]                                              ║
║          Text              X        Y      Height   Width   Pitch   Rot  ║
║ 1 :[%1O                 ]  [0.80 ][0.55 ][2.200 ][1.50 ][2.00 ][0   ]    ║
║ 2 :[%2O(1,1)            ]  [0.00 ][0.00 ][0.375 ][0.00 ][0.00 ][0   ]    ║
║ 3 :[%2O(2,1)            ]  [0.00 ][0.00 ][0.375 ][0.00 ][0.00 ][0   ]    ║
║ 4 :[45%3S               ]  [0.00 ][0.00 ][0.375 ][0.00 ][0.00 ][0   ]    ║
║ 5 :[                    ]  [0.00 ][0.00 ][0.375 ][0.00 ][0.00 ][0   ]    ║
║ 6 :[                    ]  [0.00 ][0.00 ][0.375 ][0.00 ][0.00 ][0   ]    ║
║ 7 :[                    ]  [0.00 ][0.00 ][0.375 ][0.00 ][0.00 ][0   ]    ║
║ 8 :[                    ]  [0.00 ][0.00 ][0.375 ][0.00 ][0.00 ][0   ]    ║
║                                                                          ║
║     START NO:  [496749    ]   Qty Required :[6       ]   Prefix :[    ]  ║
║        Lower : [1         ]          Count :[6       ]   Suffix :[    ]  ║
║        Upper : [999999    ]                                             ║
║    Increment : [-1        ]                 Slash in Zero   :[ ]        ║
║                                                                          ║
║  ┌────────┐ ┌────────┐ ┌──────────┐ ┌───────┐ ┌──────────┐ ┌──────────┐ ║
║  │   Ok   │ │ Cancel │ │ Barcodes │ │ Logos │ │ OperSetup│ │ FlagHelp │ ║
║  └────────┘ └────────┘ └──────────┘ └───────┘ └──────────┘ └──────────┘ ║
════════════════════════════════════════════════════════════════════════════
```

The EDIT SCREEN allows the Supervisor to change the tag layout (size and dimensions) of up to 20 available fields. See DESIGNING TAGS for details of designing tag layouts.

Example 2.32-1

Field	Text	Special Code Description
1:	%1O	Denotes - Print the information from line 1 of the OPERATOR SCREEN at the given dimensions in the X and Y locations and the specified height and width.
2:	%2O(1,1)	Denotes - Start at the 1st character of line 2 from the OPERATOR SCREEN, and include only 1 character at the given dimensions (X, Y, Height, Width).
3:	%2O(2,1)	Denotes - Start at the 2nd character and include only 1 character from line 2 of the OPERATOR SCREEN.
4:	45%3S	Denotes - Print 4 5 then a 3 digit serialized number starting at the given S/N value prompt.

Note - You must go back to the MAIN SCREEN to print a tag with the new settings.

The bottom of the EDIT SCREEN has 5 prompts; OK, CANCEL, BARCODE, LOGO, OPERATOR SETUP. These keys perform the commands listed:

    1) OK - Returns to the MAIN SCREEN and saves the new layout information.
    2) CANCEL - Returns to MAIN SCREEN without saving the new layout information.
    3) BARCODE Setup Screen - Allows the customization of bar codes.

```
════════════════════[ InfoSight Corporation – InfoTag Marking System ]════
                       ══════[ Tag Editor ]════
                    ══════[ Tag Barcode Editor ]════
1        Symbology      Scale      X          Y       Height     Link    Rot
2   1 :  [ 128bc   ]v   [2  ]   [8.00  ][0.00  ][0.400 ] [23   ] [90 ]
3   2 :  [ None    ]    [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0  ]
4   3 :  [ None    ]    [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0  ]
5   4 :  [ None    ]    [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0  ]
6   5 :  [ None    ]    [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0  ]
7   6 :  [ None    ]    [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0  ]
8   7 :  [ None    ]    [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0  ]
    8 :  [ None    ]    [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0  ]

          ┌─────────────┐                        ┌─────────────┐
          │     Ok      │                        │   Cancel    │
          └─────────────┘                        └─────────────┘

 ┌────────┐ ┌──────────┐ ┌──────────┐ ┌────────┐ ┌──────────┐ ┌──────────┐
 │   Ok   │ │  Cancel  │ │ Barcodes │ │  Logos │ │ OperSetup│ │ FlagHelp │
 └────────┘ └──────────┘ └──────────┘ └────────┘ └──────────┘ └──────────┘
```

The above example denotes - Print a Code 128 (type b,c) bar code linking the input data from fields 2 and 3 from the EDIT SCREEN with a scale of 2 (number of scan lines) at the given X, Y locations and the given height rotated at 90 degrees.

    4.) LOGO Setup Screen - Allows the customization of LOGOS

```
════════════════════[ InfoSight Corporation – InfoTag Marking System ]════
                       ══════[ Tag Editor ]════
                    ══════[ Tag Logo Editor ]════
1        Logo                 X          Y       Height    Width   Rot
2   1 :  [None     ]v      [0.00  ][0.00  ][1.000 ] [1.00] [0  ]
3   2 :  [None     ]       [0.00  ][0.00  ][1.000 ] [1.00] [0  ]
4   3 :  [None     ]       [0.00  ][0.00  ][1.000 ] [1.00] [0  ]
5   4 :  [None     ]       [0.00  ][0.00  ][1.000 ] [1.00] [0  ]
6   5 :  [None     ]       [0.00  ][0.00  ][1.000 ] [1.00] [0  ]
7   6 :  [None     ]       [0.00  ][0.00  ][1.000 ] [1.00] [0  ]
8   7 :  [None     ]       [0.00  ][0.00  ][1.000 ] [1.00] [0  ]
    8 :  [None     ]       [0.00  ][0.00  ][1.000 ] [1.00] [0  ]

          ┌─────────────┐                        ┌─────────────┐
          │     Ok      │                        │   Cancel    │
          └─────────────┘                        └─────────────┘

 ┌────────┐ ┌──────────┐ ┌──────────┐ ┌────────┐ ┌──────────┐ ┌──────────┐
 │   Ok   │ │  Cancel  │ │ Barcodes │ │  Logos │ │ OperSetup│ │ FlagHelp │
 └────────┘ └──────────┘ └──────────┘ └────────┘ └──────────┘ └──────────┘
```

2.33 Operator Screen

The OPERATOR SCREEN is designed for the normal manual use of the marker. To provide ease of use, the OPERATOR SCREEN has 8 supervisor selectable prompts on the screen. At each prompt, the operator types in the required data in the correct format and presses RETURN or ENTER to enter the data.

To move from the OPERATOR SCREEN to the MAIN SCREEN, press CTRL-X, this step requires the supervisor password to enter the MAIN SCREEN.

```
╔═══════════════[ InfoSight Corporation – InfoTag Marking System ]═══════════════╗
║   ╔═══════════════════════════════[ Tag Editor ]═══════════════════════════╗   ║
║   ║   ╔═══════════════════════[ Operator Setup Editor ]══════════════════╗  ║   ║
║ 1 ║   ║     Active     Prompt         Verify                 Auto Clear   ║  ║   ║
║ 2 ║ 1 :   [X]     [HEAT # :   ]  [#######           ]        [X]          ║  ║   ║
║ 3 ║ 2 :   [X]     [SEQ NUM:    ]  [##                ]        [X]          ║  ║   ║
║ 4 ║ 3 :   [ ]     [           ]  [                  ]        [ ]          ║  ║   ║
║ 5 ║ 4 :   [ ]     [           ]  [                  ]        [ ]          ║  ║   ║
║ 6 ║ 5 :   [ ]     [           ]  [                  ]        [ ]          ║  ║   ║
║ 7 ║ 6 :   [ ]     [           ]  [                  ]        [ ]          ║  ║   ║
║ 8 ║ 7 :   [ ]     [           ]  [                  ]        [ ]          ║  ║   ║
║   ║ 8 :   [ ]     [           ]  [                  ]        [ ]          ║  ║   ║
║   ║                                                                       ║  ║   ║
║   ║   Qty Req [X]      [START NO:   ][X]     Lower [ ]     Upper [ ]      ║  ║   ║
║   ║       ┌──────────┐   ┌──────────┐         ┌──────────┐                ║  ║   ║
║   ║       │   Ok     │   │ DEFAULT  │         │  Cancel  │                ║  ║   ║
║   ║       └──────────┘   └──────────┘         └──────────┘                ║  ║   ║
║   ╚═══════════════════════════════════════════════════════════════════════╝  ║   ║
║   ╚═══════════════════════════════════════════════════════════════════════════╝   ║
╚════════════════════════════════════════════════════════════════════════════════╝
```

   5) OPERATOR SETUP - Customizes and verifies prompts for the OPERATOR SCREEN. There are 8 available prompt fields.

The first line will print HEAT # : on the OPERATOR SCREEN and limit the operator to entering only 4 numbers. The second line will print SEQ NUM: on the OPERATOR SCREEN and limit the operator to entering only 2 numbers.
Both will auto clear once the operator starts to type.

The following describes each heading:
   ACTIVE - Toggle field (RETURN). Makes prompt show up on OPERATOR SCREEN
   PROMPT - Up to a 10 character messages for each prompt.
   VERIFY - Verifies information typed is accurate using special characters:
      $ - Alpha Upper Case Characters (A,B,C,D...)
      # - Numeric Digits (1,2,3,4...)
      ? - Any Character (A,B,C,1,2,3,?,/,%...)
      * - Any Character for any length up to the next instruction.
      [ ] -The Characters in the brackets are the only valid characters, exactly as typed.
   AUTO CLEAR - Clears the data field when the operator starts to type in the data.
         Also causes a clear after each cycle print completed

At the bottom of the OPERATOR SETUP SCREEN has 3 prompts; OK, CANCEL, DEFAULTS. The following explains each:
   OK - Returns to the EDIT SCREEN and saves the operator input layouts.
   CANCEL - Returns to the EDIT SCREEN without saving the operator layouts.
   DEFAULTS - Restores the operator setups to the defaults.

CHAPTER 3
DESIGNING TAGS

3.0 - Tag Design

Tags are designed using the Tag Edit screen. As in above screen it can be seen that up to 20 sets of characters along with up to eight different barcodes along with eight logos.   The characters barcodes and logos can be almost infinitely sized and rotated independently. This can all be done with the tag edit screen. Character sizes range from .1 inches to 2.5 inches per character.
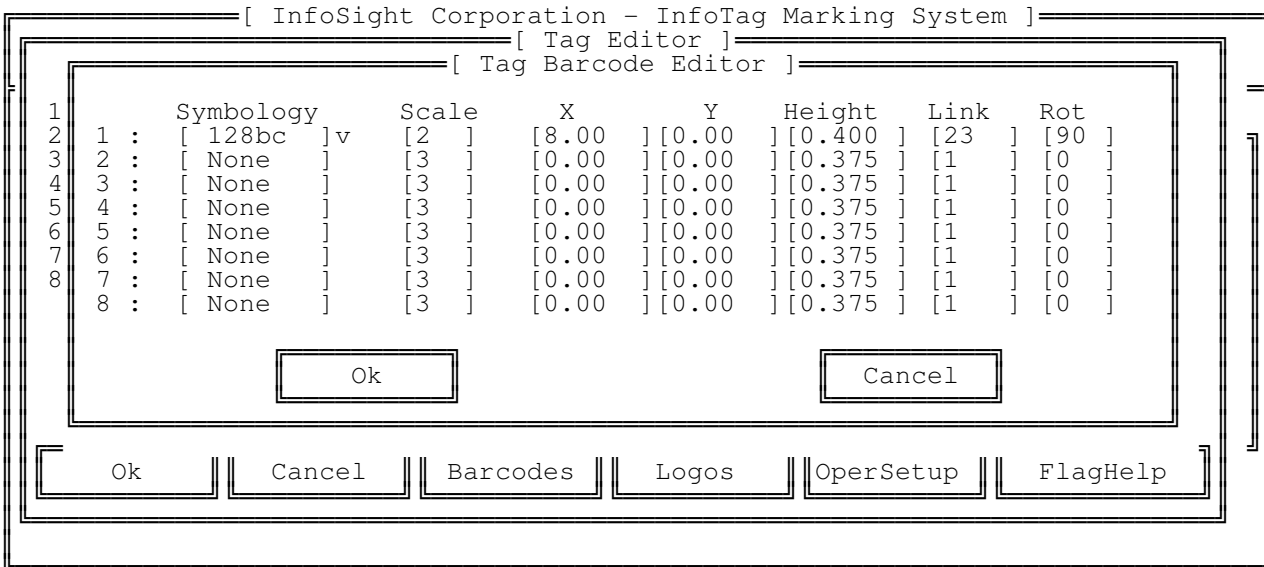
3.1 - Tag Layout Software

Tags may also be designed using The tag layout software available free on the Infosight web site.
The address to the free layout utility is : http://www.infosight.com
The software is only available in a windows environment.

3.2 - BAR-CODE EXAMPLES

Barcode types:

        Code 128
        Interleaved 2 of 5
        Code 39
        Numbra
        Code 39N
        Code 391
        Data Matrix

```
╔════════════[ InfoSight Corporation – InfoTag Marking System ]════════════╗
║ ╔══════════════════════════════[ Tag Editor ]═══════════════════════════╗ ║
║ ║ ╔═══════════════════════[ Tag Barcode Editor ]════════════════════════╗ ║ ║
1║ ║     Symbology     Scale      X        Y      Height    Link    Rot    ║ ║ ║
2║ ║ 1 : [ 128bc  ]v  [2  ]   [8.00  ][0.00  ][0.400 ] [23   ] [90  ]      ║ ║ ║
3║ ║ 2 : [ None   ]   [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0   ]      ║ ║ ║
4║ ║ 3 : [ None   ]   [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0   ]      ║ ║ ║
5║ ║ 4 : [ None   ]   [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0   ]      ║ ║ ║
6║ ║ 5 : [ None   ]   [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0   ]      ║ ║ ║
7║ ║ 6 : [ None   ]   [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0   ]      ║ ║ ║
8║ ║ 7 : [ None   ]   [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0   ]      ║ ║ ║
 ║ ║ 8 : [ None   ]   [3  ]   [0.00  ][0.00  ][0.375 ] [1    ] [0   ]      ║ ║ ║
 ║ ║        ┌──────────┐                          ┌──────────┐            ║ ║ ║
 ║ ║        │    Ok    │                          │  Cancel  │            ║ ║ ║
 ║ ║        └──────────┘                          └──────────┘            ║ ║ ║
 ║ ╚═════════════════════════════════════════════════════════════════════╝ ║ ║
 ║ ┌────────┐ ┌────────┐ ┌──────────┐ ┌────────┐ ┌──────────┐ ┌──────────┐ ║ ║
 ║ │   Ok   │ │ Cancel │ │ Barcodes │ │  Logos │ │ OperSetup│ │ FlagHelp │ ║ ║
 ║ └────────┘ └────────┘ └──────────┘ └────────┘ └──────────┘ └──────────┘ ║ ║
 ╚═══════════════════════════════════════════════════════════════════════════╝
```

   The above example denotes - Print a Code 128 (type b,c) bar code linking the input data from fields 2 and 3 from the EDIT SCREEN with a scale of 2 (number of scan lines) at the given X, Y locations and the given height rotated at 90 degrees.

3.3 - SERIAL NUMBERING

Serial numbering of tags is accomplished in the Edit screen.
By filling out the appropriate data fields.
These data fields are self explanatory.
(See edit screen)

3.4 - LOGO and IMAGE DOWNLOAD

Logos may be downloaded via the host connected using a separate utility available from Infosight.
Image downloads are explained in the Extended Protocol Manual.

Emergency After hours Service Number:1-800-401-0716

4.00 Trouble Shooting
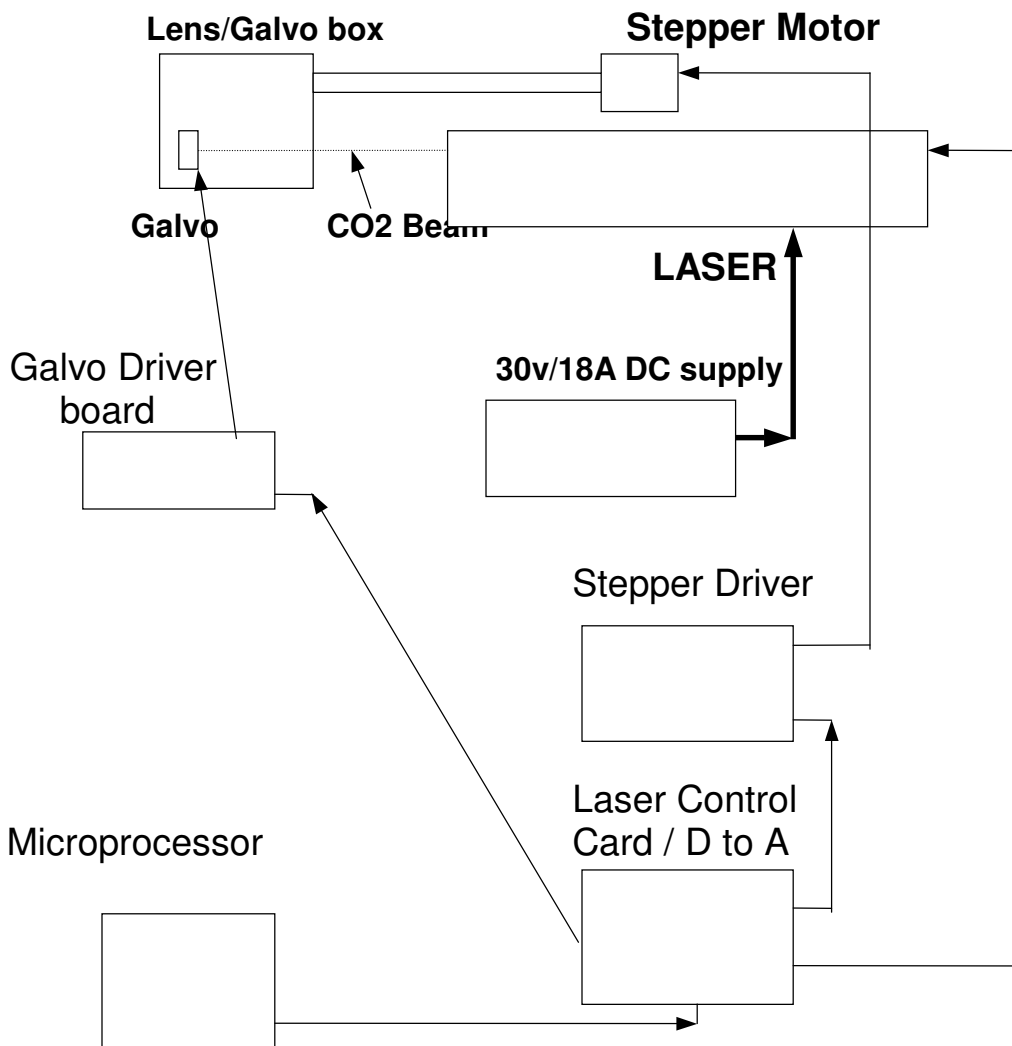
Problem: Marker does not respond to print button.
Solution: Check E-Stop
             Check key switch

Problem: No laser printing on tag (Blank tag)
Solution: Check Heat exchanger fluid level

Problem: E-Stop won't light.
Solution: Pull E-Stop button
             Check key switch

Problem: Out of tag message on screen.
Solution: Out of tag stock.

Problem: Tag exiting to far or not far enough.
Solution: Check Stepper resolution.
             Check Stepper Rate.

Problem: No display on terminal.
Solution: Check terminal configuration.
             19200 baud , No parity , 8 data bit, 1 stop , VT220
             Cable from Ke28xx should be pluged into MAIN on back of terminal.

Problem: Light print across entire tag.
Solution: Lens/Mirrors require servicing

Problem: Excessive amount of dust inside.
Solution: Replace filter on sides of marker.
             Check to make sure vent is unobstructed.

Problem: Incorrect information printed on tag.
Solution: %1O or %2O is typed in incorrect using a zero intead of an O (OH)

Problem: Fine lines in tag print.
Solution: Stepper motor rate set to low in MARKER SETUP ADVANCED Screen.
             Lens cleaning

Problem: Barcode to long for tag size.
Solution: Reduce number of characters in Barcode data.
             Use more efficient barcode symbology.
             Reduce barcode scale.

4.10 Marker Regular Servicing

1. Periodic (1 per month) replacement or cleaning of filters on side panel.
2. Removal of debris buildup in laser channel using brush.
3. Galvonmeter mirror Cleaning.
4. Final lens Cleaning. White vinegar
5. Check Heat Exchanger fluid level.

APPENDIX A
Laser Subsystem

Functional Block Diagram

Lens/Galvo box　　　　　**Stepper Motor**

Galvo　　**CO2 Beam**

LASER

Galvo Driver board

30v/18A DC supply

Stepper Driver

Laser Control Card / D to A

Microprocessor

The laser Subsystem is described above in the block diagram. The system is controlled by the microprocessor card in the STD bus rack. The Laser is a CO2 laser.

APPENDIX B
Laser Serial port connection
to an IBM-PC or equivalent.

Cable pinouts:

```
PC-DB25          Infosight      PC-DB9          Infosight

* TX  2 -----+                   RX  2 --------- 2  TX
  RX  3 -----|---- 2 TX          TX  3 --------- 3  RX
          +---- 3 RX            RTS  7 -+
 RTS  4 -+                      CTS  8 -+
 CTS  5 -+                      GND  5 --------- 7  GND
                                DSR  6 -+
 GND  7 ---------- 7 GND        DTR  4 -+
 DSR  6  -+
 DTR  20 -+
```

 * 2 & 3 are crossed.

 Note: Preferred handshake protocol is Xon-Xoff.

    XON is DC1   CTL-Q or 11h or 17 decimal
    XOFF is DC3   CTL-S or 13h or 19 decimal

APPENDIX C
LASER OPTICS CLEANING AND ALIGNMENT

Laser optics alignment should be performed by a qualified technician.

Print test Tag by pressing the print button and holding it in until print starts and then release it. At the bottom edge of the test tag will bee a thin line . Adjust galvo mirror until the line is at the edge of the tag. Tighten the mirror clamp then check for alignment again. Clean all optics with white vinegar and return all covers.

CLEANING OPTICS

Gently wipe the surface of each optic with a coth that will not leave any fibers and is not abrasive. The Cleaning solution that is recommended is **white vinegar**. <u>**DO NOT RUB HARD.**</u> Drag the cotton across the surface just fast enough so the liquid evaporates right behind the cotton. This should leave no streaks. For optics that are severely contaminated call Infosight for replacement. After cleaning replace top cover.

Do not used compressed air to clean optics!

Sample of Extended Protocol

1.) Set marker to receive information for buffer # 1
> **Transmit:** 0x01 "A" 0x02 "1" 0x03 0x0D
> **Receive:** 0x01 "A" (0x06)   0x02 0x03 XXX 0x0D
>   (0x15)

2.) Send data to operator field #1   (6 digit heat #)
> **Transmit:** 0x01 "1" 0x02 "160819" 0x03 0x0D
> **Receive:** 0x01 "1"   (0x06)   0x02 0x03 XXX 0x0D
>   (0x15)

3.) Send data to operator field #2   (2 digit sequence #)
> **Transmit:**   0x01 "2" 0x02 "01" 0x03 0x0D
> **Receive:**   0x01 "2" (0x06)   0x02 0x03 XXX 0x0D
>   (0x15)

4.) Send data to operator field #3   (2 digit width #)
> **Transmit:**   0x01 "3" 0x02 "54" 0x03 0x0D
> **Receive:**   0x01 "3" (0x06)   0x02 0x03 XXX 0x0D
>   (0x15)

5).   Send GO command
> Transmit: 0x01 "G" 0x02 0x03 0x0D
> Receive: 0x01 "G" (0x06)   0x02 0x03 XXX 0x0D
>   (0x15)

NOTE:
   1.) 0x06 in the response message means message received ok.
       0x15 in the response message means message received is not ok or faulty.
   2.) XXX are three asc characters that comprise the BCC checksum
   3.) Sending the BCC checksum is optional. (See Extended Protocol section)
   4.) XON - CTL Q   11h
        XOFF - CTL S   13h

LASER SAFETY

Proprietary InfoSight Corp.

04/23/97

InfoSight Corp.
20700 U.S. Rt. 23
Chillicothe, Oh 45601
740-642-3600
740-642-5001
http://www.infosight.com

Laser Safety

Section I: Introduction to

Lasers, like arc welders, are a source of intense light that require certain precautions to insure a safe, comfortable, compliant, working environment. This is especially true since the laser included in this marking equipment operates in the infrared (invisible) portion of the light spectrum. The enclosure surrounding the marking area is designed to prevent human exposure to the light emitted by the laser. The following information is the procedures taken to design a safe, efficient environment for laser marking equipment.

Laser products are categorized into one of four classes based upon the power of the laser light that is accessible to any person during normal operation. These classes range from Class 1, the lowest class requiring no additional safeguards other than those provided by the manufacturer, to Class 4, the highest class that requires additional operator and working environment safeguards for safe operation.

Class 1 laser marking systems include enclosures integral to the workstation that are constructed to prevent human access to the laser beam. Class 1 systems are safe in all working environments; they are installed and operated the same as any other industrial machine tool. Class 1 laser systems do not require the use of any special laser safety equipment by operators or bystanders during their normal operation.

Class 4 laser marking systems do not incorporate protective enclosures. Extra precautions are required with this type.

The laser marking system designed by InfoSight Corporation for the marking of tags complies with Class 1 during normal use because of the numerous interlocks provided (detailed in section II).

The Laser during Service and/or alignment is a Class 4. The service is done by a **Qualified Laser Service/Safety Technician**! Because of the Class 4 classification, InfoSight will provide such a person to be available to the end user of this marker.

The Power output of the laser used is 25 or 50 watts. It is a C02 infrared (invisible) laser with a wavelength of 10.57 to 10.63 microns. The Radiant energy and the wavelength are less than Class 1 requirements during normal operation.

Laser Safety

Section II: Types of safety interlocks.

There are various types of safety features provided on the Infosight laser tag marker.

The first type is **Mechanical switches**. These switches located as shown on drawing 1.
These switches removes power supplied to the laser marker, as shown in electrical drawing 2.

    Switch A -- Large Red, easily accessible, operator Emergency Stop PUSH Button.
    Switch B -- Key switch

The second type are the **optical sensors**. Sensors monitor whether tag material is in place and the marker is able to move the tag material. These two sensors are monitored by the marking microprocessor.

The third type is **Mechanical design**. Here, narrow slots are provided to eliminate the chance of chances of laser radiation. The beam path is entirely enclosed in a metal shield, with suitable material that will absorb the heat produced by the beam emitting from the CO_2 laser.

The fourth type is the Password **Security access software** written into the marking systems microprocessor. This Software requires an **operator password** to place the marker on-line. It also requires a **supervisor password** to change layout of tags or to alter the operating parameters of the marker itself.

Laser Safety

The features above and precautions described above taken by Infosight are in place with the safety of the user in mind. Should you have any questions or suggestions please do not hesitate to call.

Internal Laser Specifications (25 Watt)

Laser Type...25 watt CO_2 pulsed wave
Laser Classification..Class IV during service
(Title 21 CFR, Part 1040
U.S., FDA)
Wave Length ....10.57 to 10.63 microns
Power Output:
Typical ....25 watts (@ 5kHz)
Minimum on delivery ....18 watts (@ 5kHz)
End of life..15 watts (@ 5kHz)
Power Stability ....after 30 sec. warm-up: ±5%
Mode..TEMoo equivalent - 95% purity
Beam size...3.5mm
Divergence (mR)..5
Polarization ....Random
Modulation ....to 5 kHz
Pulse Repetition frequency ....5 kHz
Electrical Control...TTL input (+3.5 V) to 20 kHz
Electrical Input ....28 VDC version (48-2-28)
28-32 VDC, 16A max
Tickle pulse...1.0 µS (@ 5kHz)
Thermal shutdown temperature ....140º F ± 2.7ºF, 60º C ±1.5ºC
Laser tube life expectancy ....35,000 hrs.
Laser shelf life (no use) ....14 years

Internal Laser Specifications (50 Watt)

Laser Type...50 watt CO_2 pulsed wave
Laser Classification..Class IV during service
(Title 21 CFR, Part 1040
U.S., FDA)
Wave Length ....10.57 to 10.63 microns
Power Output:
Typical ....50 watts (@ 5kHz)
Minimum on delivery ....40 watts (@ 5kHz)
End of life..40 watts (@ 5kHz)
Power Stability ....after 30 sec. warm-up: ±5%
Mode..TEMoo equivalent - 95% purity
Beam size...3.5mm
Divergence (mR)..5
Polarization ....Random
Modulation ....to 5 kHz
Pulse Repetition frequency ....5 kHz
Electrical Control...TTL input (+3.5 V) to 20 kHz

Electrical Input ....28 VDC version (48-5-28)
                                                   28-32 VDC, 28A max

Tickle pulse...1.0 µS (@ 5kHz)
Thermal shutdown temperature ....140º F ± 2.7ºF, 60º C ±1.5ºC
Laser tube life expectancy ....35,000 hrs.
Laser shelf life (no use) .... 14 years

Laser Specifications:

Type of laser	25 or 50 watt CO_2 PULSED WAVE (RF Excited)
LASER Classification	Class I During normal operation
Wave length	10.6 microns
Mode	TEMoo 95% purity
Polarization	Linear-vertical 50:1 extinction min.
Pulse Repetition frequency	5 kHz
Emergent beam size	3.5 mm
Divergent beam size	
Tickle pulse	1.0 us @ 5 kHz
Power Supply	30vdc @ 16/32 amps
Laser Tube life expectancy	>20,000 hours
Thermal shutdown	50 degrees C

Certifications:
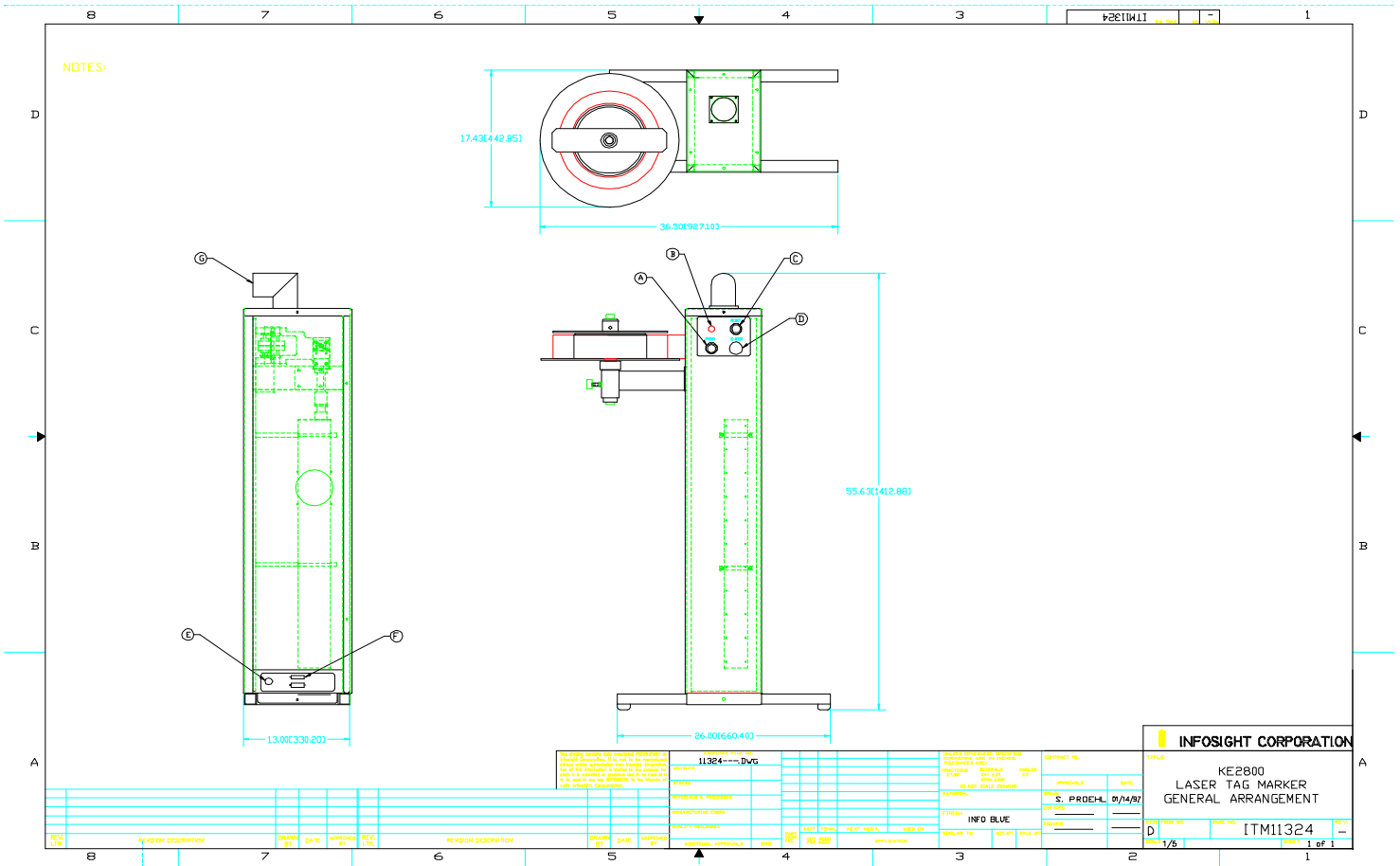 **EMC Emissions**
    EN 55022:1994/A1:1995/A2:1997 Class A ITE emissions requirements (EU)
    FCC 47 CRF Part 15 Class A emissions requirements (USA)
  EMC Immunity:
    EN 50082-2:1995 EMC heavy industrial generic immunity standard

General Arrangement

Affixing the KE28xx to solid platform

Important:

The KE28xx support legs are designed to be anchored to the floor or concrete to prevent the unit from tipping over in the unlikely event of a force exerted upon the side surfaces of the units. Incorporated in the design of the support legs are 4 x 33/64" thru-holes. These four thru-holes are to have placed through them, suitable anchor bolts to affix the Ke28xx to the floor. The type of anchor bolt used will depend upon the base material the Ke28xx will be set upon.   Recommended anchor bolts are listed below.

Note: Anchor bolts used are to withstand a tension weight of at least 50 lbs. each.

Manufacture	Description	Floor type
Hilti	KB II 38-3 3/8" Kwik bolt	Concrete
	Cast in place 3/8-16UNC 2"	Concrete
	3/8" x 2" Lag bolts	Wood
	3/8" x 4 " J bolts	Steel Grating

APPENDIX G
Electrical Drawings

APPENDIX H
ADVANCED SETUP VALUES

	KE2800	KE2856/54	KE2852/53
Heat : (4.1)	10	50	150
Stepper Res.	0.00505	0.00505	0.0103
Stepper Delay	150	450	600
Mirror Res.	0.006	0.006	0.012627
Rev. Take up	1	1	1
Laser Off Tickle	7	7	7
Tear Off location	7	7/Appl dep	7/Appl dep
Cache	ON[X]	ON[X]	ON[X]
High definition	ON[X]	ON[X]	OFF[ ]
Number of lasers	1	2	2
Pixels per Row	560	560	280
Galvo DIvider	5	5	10