ScanMate Dm series
Scan Head
Hardware Manual

Eastern Logic Inc. V1.0

CONTENT:

Introduction

This manual details the instructions on how to install and operate the ***ScanMate*-Dm Scan Head**. Included is information on setting up the hardware in preparation for your software commands.

Be careful to observe that the hazards and the laser beam path you can expect while running the ***ScanMate-Dm* Scan Head**.

The ***ScanMate-Dm* Scan Head** is extremely intricate, and since it consists of the galvanometers that reflect the laser beam, it can be hazardous if certain precautions are not taken. Please be alert to the safety considerations and specific procedures regarding the ***ScanMate-Dm* Scan Head** and the laser you are using.

UNPACKING

a) Carefully unpack the contents from the box.
b) Save shipping container and packaging material in case you need to return unit for service.
c) Check contents of the box against the packing list to assure all parts have been received.
d) Inspect each item to assure it is not damaged.

MANUFACTURER

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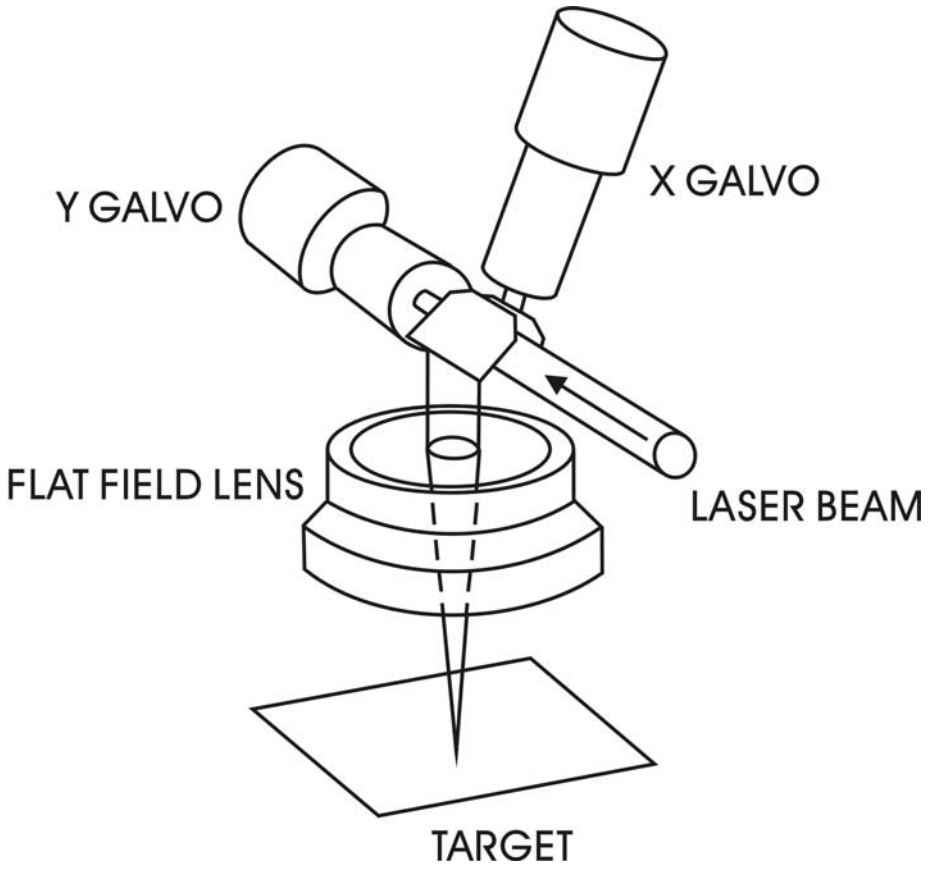
Theory of Operation

***ScanMate-Dm* Scan Head** is an all-in one designed module. The module consists of 2 galvanometer scanners (X and Y), 2 servo boards(X and Y) , 1 D/A receiver board, optics (f-Theta lens) and lens adaptor, all enclosed in a black anodized aluminum case.



X and Y Galvanometric Scanners with a Flat Field Lens

Eastern Logic Inc's ***ScanMate-Dm* Scan Head** provide the capability of deflecting optical beam in an XY configuration for all possible laser applications.
The synchronized actions of two galvanometer servo-controlled turning mirrors direct the laser beam to specific locations on a target material surface in both

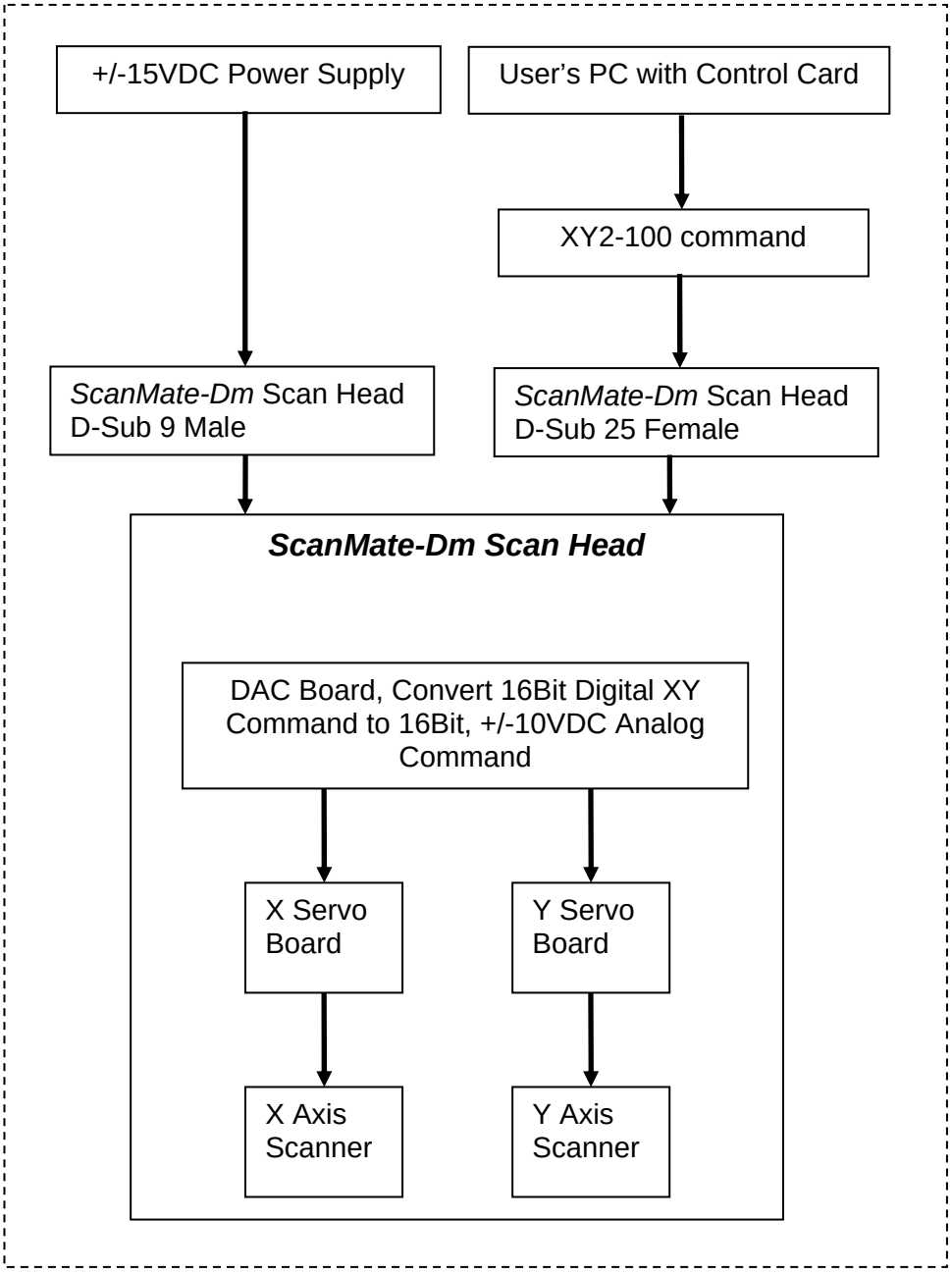
the X and Y directions.

System Configuration

The ***ScanMate-Dm*** **Scan Head** is a device for a laser beam positioning system. It is intended for use by OEM customers, integrators, and sophisticated end users.

It consists of a purpose designed integrated deflection head with an optional PC based hardware and software package. The following block diagrams are showing the typical ***ScanMate-Dm*** **Scan Head** system components

ScanMate-Dm Scan Head with PC and Control Card



Eastern Logic Inc provides the following items that make up the *ScanMate-Dm* Scan Head package:

- ***ScanMate-Dm*** Scan Head with 2 galvanometer scanners, D/A receiver board, Servo boards and lens adaptor.
- 4 meters analog command signal cable.
- 4 meters power supply cable.
- Software package-MarkingMate if ordered.
- Documentation.

The Customer provides:

- A laser control interface cable.
- A computer
- A method of mounting the ***ScanMate-Dm*** **Scan Head.**
- Power supply with the following specifications:

Voltage	±15 V
Current	10A
Ripple	≤ 100 mV
Noise	≤ 0.5% DC to 30MHz

a. Temperature

Storage Temperature:	-10°C to +60°C
Minimum Operation Temperature:	+15°C
Maximum Operating Temperature:	+55°C
Humidity:	Non-condensing

Safety and Warning

SAFTY:

Eastern Logic Inc's **XY Scan Heads** are designed to provide maximum flexibility and ease of use for laser beam deflection. Such a device requires the user to assure the overall safety of the configuration in use. Please follow carefully the requests for the different laser classes.
It is the user's responsibility to insure that the following is understood:

1) Before installation or usage of a laser system you have to be aware about the regulations on laser safety.
2) During maintenance activities of laser systems the laser safety classes may change. In that case the customer has to take appropriate actions in advance.
3) Certified lasers contain features to assist in their safe usage. These protective features within the Eastern Logic Inc **XY Scan Heads** should not be defeated.

A brief description of the radiation classes are shown in the following table.

LASER CLASS	DESCRIPTION
Class I	Lasers are not considered to be hazardous.
Class IIa	Lasers are hazardous if viewed for periods greater than one thousand seconds.
Class II	Lasers are chronic viewing hazards.
Class IIIa	Lasers may represent acute, intrabeam viewing or chronic or acute viewing hazards when viewed with optical instruments.
Class IIIb	Lasers are an acute hazard to skin and eyes from direct radiation.
Class IV	Lasers are an acute hazard to skin and eyes from direct or scattered radiation.

Note that, besides radiation, lasers may present other hazards, e.g.; electric shock or creation of poisonous fumes.

Warning:

Do not stare into the beam, place any parts of your body in the beam path, or expose yourself to reflections of powerful beams. You should use only a Class 1 HeNe Laser for alignment.

Maintain During Usage

To maintain the ***ScanMate-Dm*** Scan Head please take following actions:

1) Protect the Scan Head from humidity, dust and aggressive steam to avoid damages to mirrors, objectives or electronics.
2) Always use cloth or cotton buds to touch optical components.
3) Avoid any mechanical tension to the connection cables.
4) Protect the Scan Head from electromagnetic fields and electrical discharges. This can severely damage electronic boards. Damage to the electronic circuits caused by electrical discharge may not make itself immediately apparent – but may result in malfunction at some later time thus affecting reliability of the product.

Flat Field Lens

Before installing a lens onto the Scan Head, visually inspect the lens surface for any evidence of damage, i.e.; cracked lens, cracks on the edges of the lens, scratches on the lens surface.

If the lens is dirty, clean the lens with proper tools. Do not rest any objects on top of the lens as this may result in damaging the lens.

If there is a protection glass, make sure it is clean, place it over the front of the lens. Screw the Mounting Ring tight over the Protection Glass. Hand-fit lens protection cap onto the lens assembly.

The lens assembly is screwed into the Scan Head. Carefully and securely mount the lens to the ***ScanMate-Dm*** Scan Head. (DON'T CROSS-THREAD THE LENS ASSEMBLY). The lens should be screwed on completely.

Mounting the *ScanMate-Dm* Scan Head

The Scan Head requires a mounting flange that will match the mounting holes on the **Beam Input** side of the assembly. The attached figure and the outline drawings, can be used to determine the dimensions for manufacturing a mounting flange.

1) Insert 4x M4 size button head screws into the holes of the mounting flange. The screw length should be long enough to provide three or more full turns into the tapped holes.
2) Using a hexagonal wrench, tighten these 4 screws. Alternate tightening the 4 screws so that the scan head comes together evenly onto the mounting flange.

Maintence

The *ScanMate-Dm* Scan Head assembly is sealed to dust but is not water tight.

The housing can be cleaned with a slightly dampened cloth. If a cleaning agent

is necessary, use only a small quantity of non-aggressive cleanser (e.g. soap).

Lens Cleaning Procedure

Optical components should always be handled using suitable gloves, or finger-cots, in order to avoid finger prints.

1. Surface dust and loose particles must be blown form the component using an air bulb, ideally one with a non-return valve.
2. Always use cloth or cotton buds which are moistened with **pure** alcohol or acetone. Never use cleaning materials which are dry.
3. Use a soft, lint-free lens cloth. The cloth has to be moistened with pure acetone, laid gently on one edge of the component and drawn in a continuous movement to the opposite edge.

DO NOT APPLY PRESSURE. DO NOT RUB!
Rubbing may cause permanent surface marks.

4. Blow away residue liquid in one direction with an air bulb.

5. Make sure that no visual contaminants remain on the optical surface.
6. Stubborn stuck-on particles may require an attempt to dislodge them by the local application of a cotton bud moistened with pure acetone.
7. Finish off as described in (3) above.
8. Organic contamination cannot usually be removed using solvents such as acetone. The residue should be removed using distilled water and a lens cloth prior to finishing per (3) above.

Troubleshooting and Possible Solutions

1. **Scan head does not deflect the laser beam.**
   Probable Reason: Scan head control malfunction.
   Solution:
   a. Check power connections and analog command cable to Scan head.
   b. Check software commands.

2. **Laser will not mark when ordered by computer.**
   Probable Cause A: Laser modulation malfunction.
   Solution: Check connections between laser controller and laser.

   Probable Cause B: Laser control malfunction.
   Solution: Check all electrical connections and power supplies if PCMark card / MC1 is used.

   Probable Cause C: Laser blocked or shutter closed.
   Solution: Check path of laser beam.

3. **Decrease in marking quality.**
   Probable Cause A: Dirty protection glass.
   Solution: Clean glass per instructions in Maintenance Section.

   Probable Cause B: Dirty or damaged mirrors
   Solution: Check mirrors, If mirrors are damaged please send in the scan head for repair.

Probable Cause C: Improper marking parameters.

Solution: Check marking parameters.

If the problem cannot be solved as described, please send the Scan head to Laser Solution Technical Service.

Pin Configurations of *ScanMate-Dm* Scan Head

D-Sub 25p Female – Digital In

Pin No.	Description	Pin No.	Description
1	CLOCK-	14	CLOCK+
2	SYNC-	15	SYNC+
3	CHAN1-	16	CHAN1+
4	CHAN2-	17	CHAN2+
5	DO NOT CONNECT	18	DO NOT CONNECT
6	STATUS-	19	STATUS+
7	DO NOT CONNECT	20	DO NOT CONNECT
8	DO NOT CONNECT	21	DO NOT CONNECT
9	+15VDC	22	+15VDC
10	+15VDC	23	GND
11	GND	24	GND
12	-15VDC	25	-15VDC
13	-15VDC		

Warranty

Eastern Logic Inc warrants this product to be free from defects in materials and workmanship for 12 months from the date of shipment. Laser Solution Technology will, at its option, repair or replace the product if it is defective within the warranty period and returned, freight pre-paid, to a service center designated by Eastern Logic Inc. Laser Solution Technology requests that they carefully pack units in their original packing or equivalent. Under warranty, Eastern Logic Inc is not obligated to repair damage to any units resulting from the following conditions (customers are responsible for defining which conditions are applicable to their product):

a) Personnel other than Eastern Logic Inc representatives attempting to repair or service the product.
b) Improper use of the equipment.
c) Connecting the product to incompatible equipment.
d) Personnel other than Eastern Logic Inc representatives modifying the product.
e) Scratches and chips on any optical surface after two weeks from the date of receipt.
f) Damage to any optical surface from improper handling or cleaning procedures. This applies specifically to those items subjected to excess laser radiation, contaminated environments, extreme temperature or abrasive cleaning.

Customers assume all responsibility for maintaining a laser-safe working environment. OEM customers must assume all responsibility for **CDRH** (Center for Devices and Radiological Health) certification.

There is no implied warranty of fitness for a particular purpose, and Eastern Logic Inc is not responsible for consequential damages. Individual components manufactured by Eastern Logic Inc or others may be covered by their own warranties. Refer to the appropriate manuals for this information.