

### SYSTEM OVERVIEW

The Telesis® NOMAD 2000 marking system permanently prints messages into a variety of materials such as steel, aluminum, and plastic. An electric solenoid accelerates a hardened pin to indent dot matrix characters into the item being marked. Character shape, size, density, and location are determined by the user through the marking system software.

The **Marking Head** is an electromechanical marker. The internal, mechanical components position the pin cartridge and an electric solenoid fires the marking pin. A spring returns the pin to its idle position within the cartridge. The marking head moves the pin cartridge through X- and Y-axis rectilinear motions to reach the correct position for each dot of the characters to be marked. The system software automatically controls pin extension to mark the message.

The marker uses two stepper-motor drives to rapidly and accurately position the pin at coordinate-defined locations in the marking window within 0.006 mm (0.00024"). The marker accommodates the rigorous dynamics of impacting, rebounding, and rapid positioning of the marking pin through a linear rail/ball bearing saddle assembly, ceramic-coated guide shaft/linear bushing assemblies, and drive motors with concentric, linear drive screws.

The lightweight and portable NOMAD 2000 is battery operated and designed for remote operation. The hand-held marker incorporates a pistol grip handle with a Start Print pushbutton switch.

The integral standoff with its padded front surface is held against the marking surface while marking. The standoff can be adjusted forward and aft to change the pin stroke.

The **Pin Cartridge**, machined from engineered plastic materials, offers long life with little maintenance. Screws attach the pin cartridge to the marking head for easy removal, cleaning, and pin replacement.

The **25XLE-series Marking Pins** are made of tungsten carbide and are available in 30° and 45° cone angles.

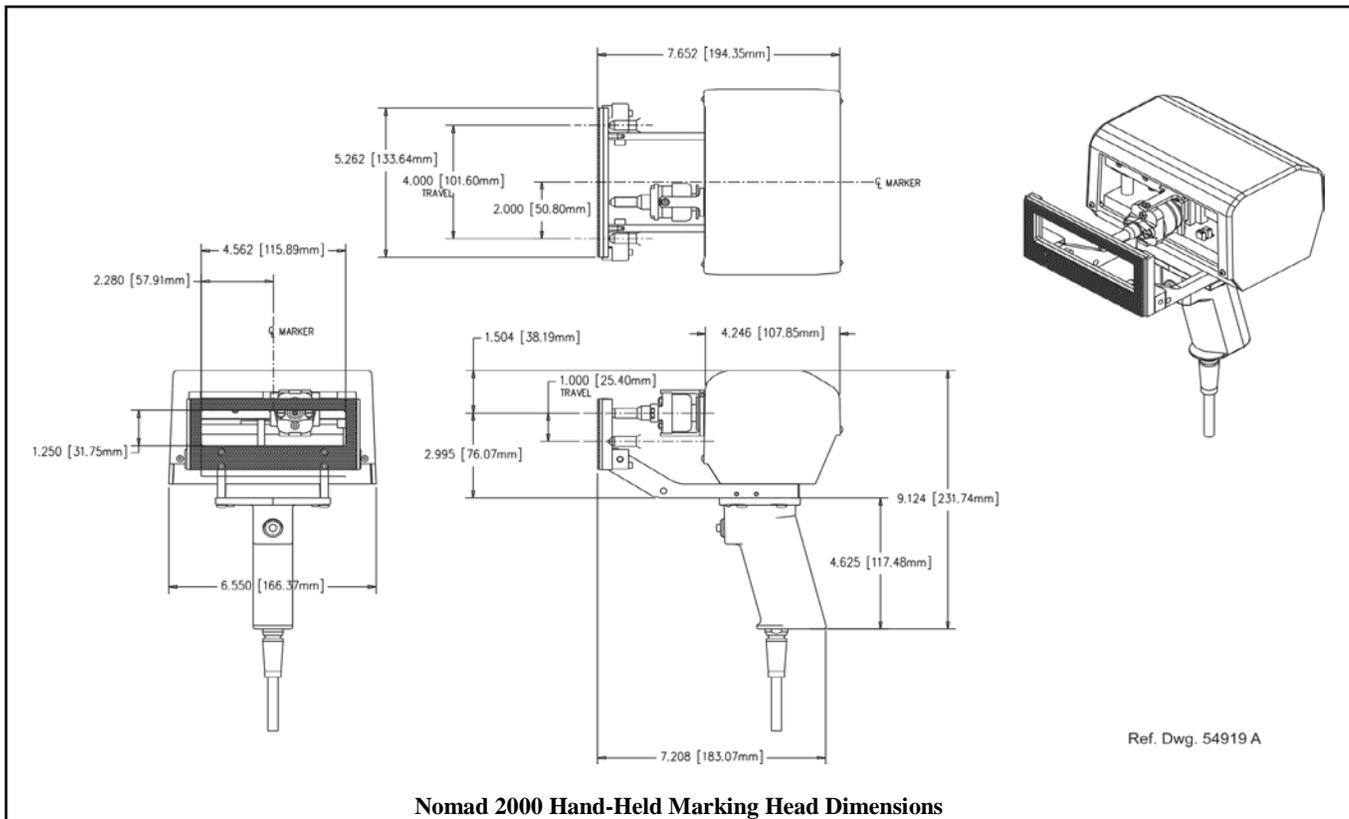
The **Marker Cable** Permanently connects the marker to the controller. The cable is 2 m (6.5 ft.) long and is pre-wired to the marking head.

**NOMAD 2000 (470HH) Controller** provides the electrical interface and software control of the Nomad 4000 marking head. (Refer to *NOMAD Controller Specifications* for details.)

### SYSTEM OPTIONS

- Backup Utility Software
- Bar Code Scanner
- Logo/Font Generator Software
- Upgrade Utility Software

# NOMAD 2000 Marking System



Nomad 2000 Hand-Held Marking Head Dimensions

## SYSTEM SETUP

The marking head is designed to be used as a hand-held marker.

The following procedures provide only a **general overview of the operation process**. For initial startup procedure, see the *NOMAD 2000 Getting Started Supplement* and for complete installation instructions, refer to the *NOMAD 2000 Installation & Maintenance Manual* and the *NOMAD 2000 Operation Manual*.

### CAUTION

The NOMAD 2000 is not a sealed unit. See the Environmental consideration Considerations on pag.4-6

1. It is recommended but not a necessity to locate the controller on a flat, level and stable surface close as practical to marking head. Standard marker cable length is 2m (6.5 ft.).
2. Press the controller power button to ON (on front panel) to start the marking system software.
3. Load the needed pattern.
4. Adjust pin stroke for impact depth, as required
5. Place the marking head on the correct location and print pattern.

**NOMAD 2000- MARKING HEAD**

**Specifications**

The NOMAD 2000 marking head specifications are subject to change without prior notice.

Dimensions.....	see <i>NOMAD 2000 Hand-Held Marking Head Dimensions</i>
Rating .....	NEMA 1 (I.P. 10)
Weight .....	1.58 kg (3.47 lb) marker only
Noise .....	80.0 dB (max); 72.5 dB (LEQ) See <i>Marking Noise</i> for details
Vibration .....	Does not exceed 2.5 m/s <sup>2</sup> See <i>Vibration Data</i> for details
Marking Area (W x H).....	100 x 25 mm (4.0 x 1.0 in.)
Number of Impact Pins.....	1
Pin Type .....	Carbide with 30° or 45° cone angle
Pin Stroke (max.).....	3.8 mm (0.15in) max
Operating Temp. ....	0° to 50°C (32° to 122° F), non-condensing
Humidity .....	10% to 80%

**NOMAD 2000 MARKING HEAD (continued)**

**Marking Characteristics**

The NOMAD 2000 can accommodate character sizes from .762 to 25 mm (.030 to 1.0") in .025 mm (.001") increments. Characters can be rotated in 1° increments with printing resolutions from 5 dots/cm (10 dots/in.) to 75 dots/cm (200 dots/in.) for an engraved look.

**Marking Speeds**

The system will mark 2.0 characters per second (max.) using 5x7 font, 3 mm (.118") high, 2mm (.080") wide characters. Speeds will vary slightly depending on the selected character size, style, and dot density. Specific times can be verified by a Telesis representative.

**Marking Noise**

Sound pressure-level tests were conducted on the Marking System using a Larson-Davis Model 710 sound pressure meter while dry firing the marker at a 50% duty cycle. The maximum sound pressure level during the test cycle was measured at 80.4 dB. The time-weighted average (LEQ) using the 3 db rule without threshold was 72.5 dB. Typical applications average a 20% to 30% duty cycle where the time-weighted average would not exceed 68.3 dB(A).

The sound pressure-level tests were carried out under controlled conditions, imitating as closely as possible, predicted normal operation. However, noise level is heavily dependent on the part being impacted. Conditions such as the material being marked, the rigidity of the work piece, machine settings, ambient noise, etc., may all vary when in operational use. Such variables will alter the actual noise level.

Despite detailed guidance provided with each machine, variable operating conditions are beyond the control of Telesis. The responsibility of establishing safe working levels of use remains with the end user. Accordingly, you should conduct your own sound pressure-level tests for your application while marking actual work pieces.

**Pin Life**

Pin life depends largely on the type of material being marked, how hard or abrasive it is, and the required marking depth. On typical metals with a hardness of Rockwell Rb47, marking at a depth of .127 mm (.005"), carbide pins average approximately 9 million impressions before needing sharpened.

**Marking Depth**

The NOMAD 2000 can obtain a marking depth of .127 mm (.005") in mild steel (Rb53) using a 25XLE carbide pin with a 45° cone angle. The depth of mark can be adjusted over a significant range by changing the impact force (software parameter) or the impact distance (pin stroke). Note that the maximum pin stroke distance is 3.8 mm (.15"). Specific depths can be verified by a Telesis representative.

# NOMAD 2000 Marking System

## NOMAD CONTROLLER

The NOMAD controller is a permanently attached controller via the marker cable to the marker head. It is a portable unit powered by a rechargeable factory installed lithium Battery.

**CAUTION**

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- \* Make sure the Nomad controller is at ambient temperature before charging.
- \* During discharge and handling of the NOMAD controller, do not exceed 50 °C (122 °F)
- \* Use Telesis Lithium Polymer/Li-ion chargers only. Do not use NiMH or NiCd chargers.
- \* Never charge the Nomad controller unattended.
- \* Wire lead shorts can cause fire. \*Never charge the Nomad controller if the Nomad controller's case is physically damaged.
- \* Never store or charge the Nomad controller in extreme temperatures.
- \* Never charge the Nomad controller while marking at the same time.
- \* Charge the Nomad controller in an isolated area, away from flammable materials or liquids.
- \* Always have a Class D fire extinguisher for emergency use.
- \* Store the Nomad controller at room temperature between 5 and 27 °C (40 and 80 °F) for best results.
- \* When transporting or temporarily storing the Nomad controller in a vehicle, temperature range should be greater than -6°C (20 °F) but no more than 65°C (150°F).
- \* Storing the Nomad controller at temperatures greater than 76°C (170 °F) for extended periods of time (more than 2 hours) may cause damage to battery and possible fire.

## Nomad Specifications

The NOMAD Controller specifications are subject to change without prior notice.

Compliance .....	CE, RoHS
Configurations .....	Portable battery operated
Rating.....	(I.P. 50) for General use
Dimensions .....	refer to the NOMAD Controller Dimensions drawing
Weight .....	8 lb. (3.63kg) controller only
Op. Temperature	32° to 122° F (0° to 50°C)
Op. Humidity .....	10% to 80% non-condensing
Cooling.....	Internal, thermostat-controlled fan

Communications ..... RS232, Serial comm port and USB (data backup and data transfer)

## Battery Charger

Power Requirements ..... 37 Volt Lithium Battery with AC charging adapter

Input ..... 100 ~ 240 Volts

Output ..... 42Volt ± 0.2 Volts

Charging current..... 2Amp ± 0.1 Amp

Operation Temp ..... -10° C ~ 40° C (14° F ~ 104° F)

Rating..... NEMA® 1 ( I.P. 50)

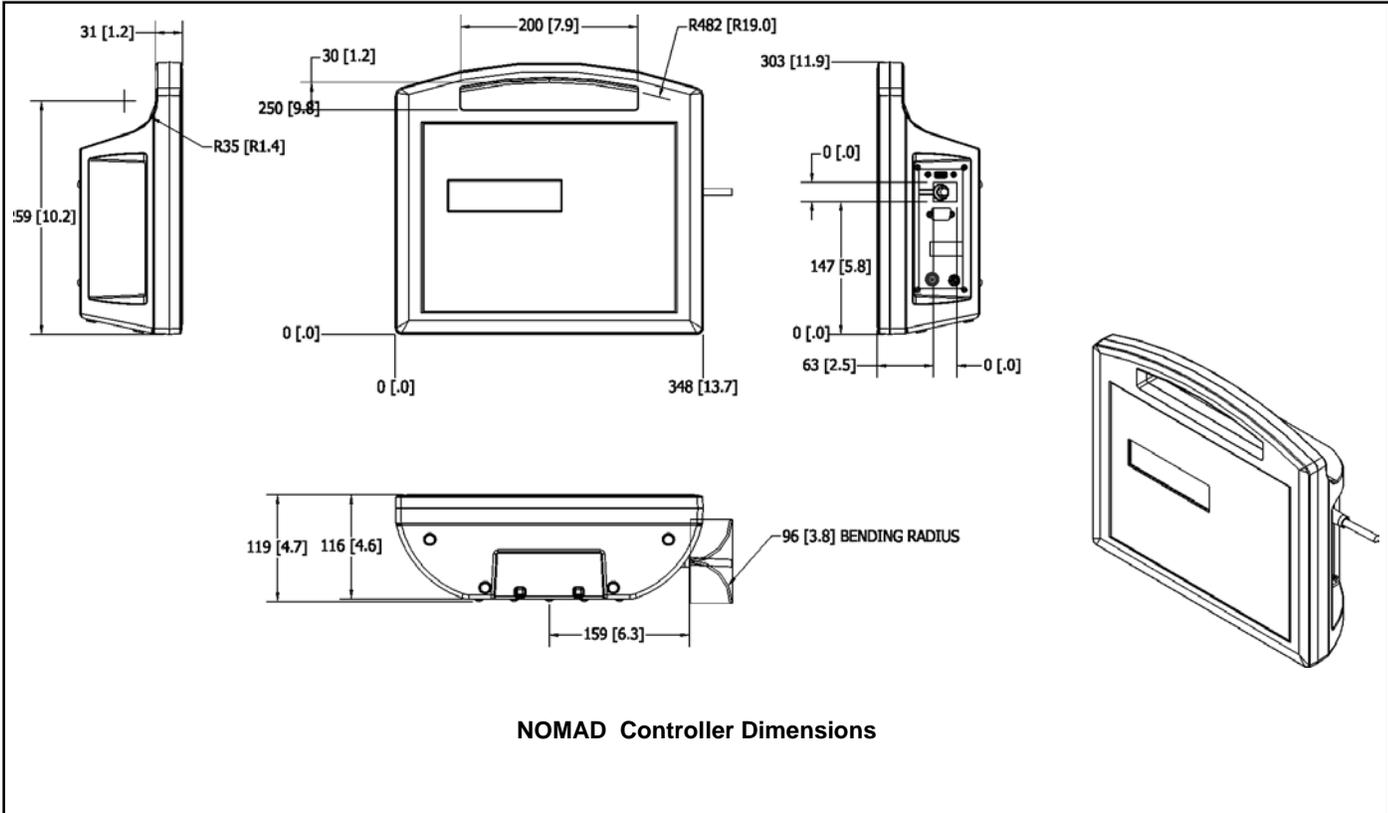
## Environmental Considerations

The following environmental considerations must be taken into account when using the NOMAD Controller.

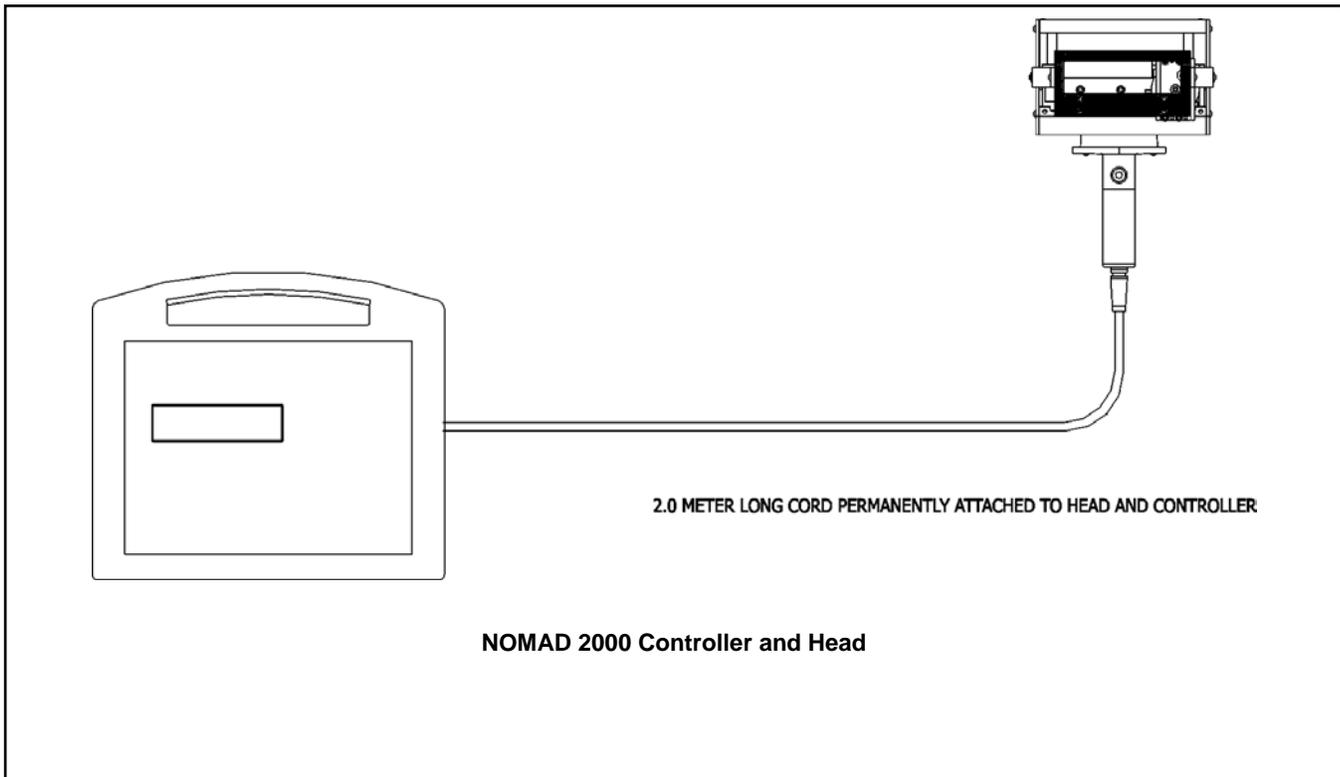
**Contaminants.** The non-vented NOMAD is rated NEMA® 1 (IP50) Where liquid contaminants are present, the possibility exists that these contaminants can be forced into the NOMAD controller and possibly result in failure. For that reason, in these types of environments, the controller should be protected. The Unit should also be protected or not used in extreme heat or cold situations to insure proper functions.

## NOMAD -based System Software

The system software is installed in the controller. It provides the user interface for the operator to control the marker. The software also provides a library for storing, loading, and editing user-defined patterns. Patterns are files stored in the controller's memory. Depending on the size of the pattern files, the controller can store up to 200 patterns. Each pattern contains one or more fields; each field defines a single object. Printable objects may be created to define text strings, arc-text strings, geometric shapes, graphics, and machine-readable data matrix symbols. Printable text fields may include alphanumeric characters, symbols, and special message flags. Message flags automatically insert data into the text string, such as serial numbers, times, dates and user-defined codes. Refer to the *NOMAD Operation Manual* for details.



**NOMAD Controller Dimensions**



**NOMAD 2000 Controller and Head**

# NOMAD 2000 Marking System

## NOMAD 2000 CONTROLLER SAFETY LABELS

The following illustration shows the labels and their locations on the NOMAD 2000 controller. Please familiarize yourself with the laser labels and their locations prior to operating the laser marking system.



NOMAD 2000 Controller front panel



NOMAD 2000 Controller back panel



NOMAD 2000 Controller side panel

①



28181 River Dr.  
Circleville, Ohio 43113  
740-477-5000

④

- Operating Temperature
- Charging : 0 to 45 °C (32 to 113 °F)
- Discharge: 0 to 50 °C (32 to 122 °F)
  - 1) Make sure the Nomad controller is at ambient temperature before charging.
  - 2) During discharge and handling of the NOMAD controller, do not exceed 50 °C (122 °F)
- Use Telesis Lithium Polymer/Li-Ion chargers only. Do not use NIMH or NiCd chargers.
- Never charge the Nomad controller unattended.
- Wire lead shorts can cause fire.
- Never charge the Nomad controller if the Nomad controller's case is physically damaged.
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84424

③



FUSE: 7A



FUSE: 4A

②

Model

Date of Mfg

S/N

Model = TMC470HH  
Serial Number = 79410XXXXX  
MFG Date = MONTH YEAR

Where XXXXX is serial number  
MONTH: Full month name (e.g. JANUARY)  
YEAR: Four digits (e.g. 2015)

Ref. Dwg. 79410

**Interface Panel**

The side panel of the controller provides various ports for the marker cable, USB, Serial connection and the charger port See below.

**Serial Interface.** The Comm Port allows connection to remote serial devices such as a bar code scanner. See Serial Communications for details.

**USB Interface.** The USB Port allows you to connect a memory stick/flash drive for pattern storage/retrieval and for software upgrades.

**Charging Port.** Recharges the battery pack for the NOMAD . Confirm the battery monitor symbol on the top left of the main menu on the controller for the battery charged status. While charging have the charger cable in an open area to allow ventilation to prevent overheating. The Red charging indicator on the charging cable will turn green when fully charged.

**RS232 Bar Code Scanner**

The marking system software allows you to configure communication parameters to transmit and receive data to and from Comm Port1. This is to be used for the optional Bar Code Scanner.



**Never use any other charging cable than the one provided by Telesis Technologies. The charger can generate heat and must be used in dry a ventilated area**



**Never Operate the NOMAD 2000 during the charging process**

**TRADEMARKS**

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