

SYSTEM OVERVIEW

The Telesis[®] NOMAD 4000 marking system permanently prints messages into a variety of materials such as steel, aluminum, and plastic. A hardened pin is accelerated to indent dot matrix characters into the item being marked at depths up to .30 mm (.012 in.) in mild steel. Character shape, size, density, and location are determined by the user through the marking system software.

The **Marking Head** is an electromechanical marker. A metal-formed cover houses the internal, mechanical components that position the pin cartridge. An electric solenoid fires the marking pin and an internal 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 .006 mm (.00024 in.). 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 rack and pinion gearing.

The lightweight and portable NOMAD 4000 is battery operated and designed for remote operation. The hand-held marker incorporates a pistol grip handle with a Start Print pushbutton switch. A rear-mounted handle provides additional stability during marking. It can be used in virtually any orientation.

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 cartridge/solenoid assembly can be configured for Long Throw or Short Throw operation. Long Throw configuration allows for deeper marks while Short Throw configuration allows for faster marking.

The **Marking Pins** are made of carbide and are available in 30° and 45° cone angles.

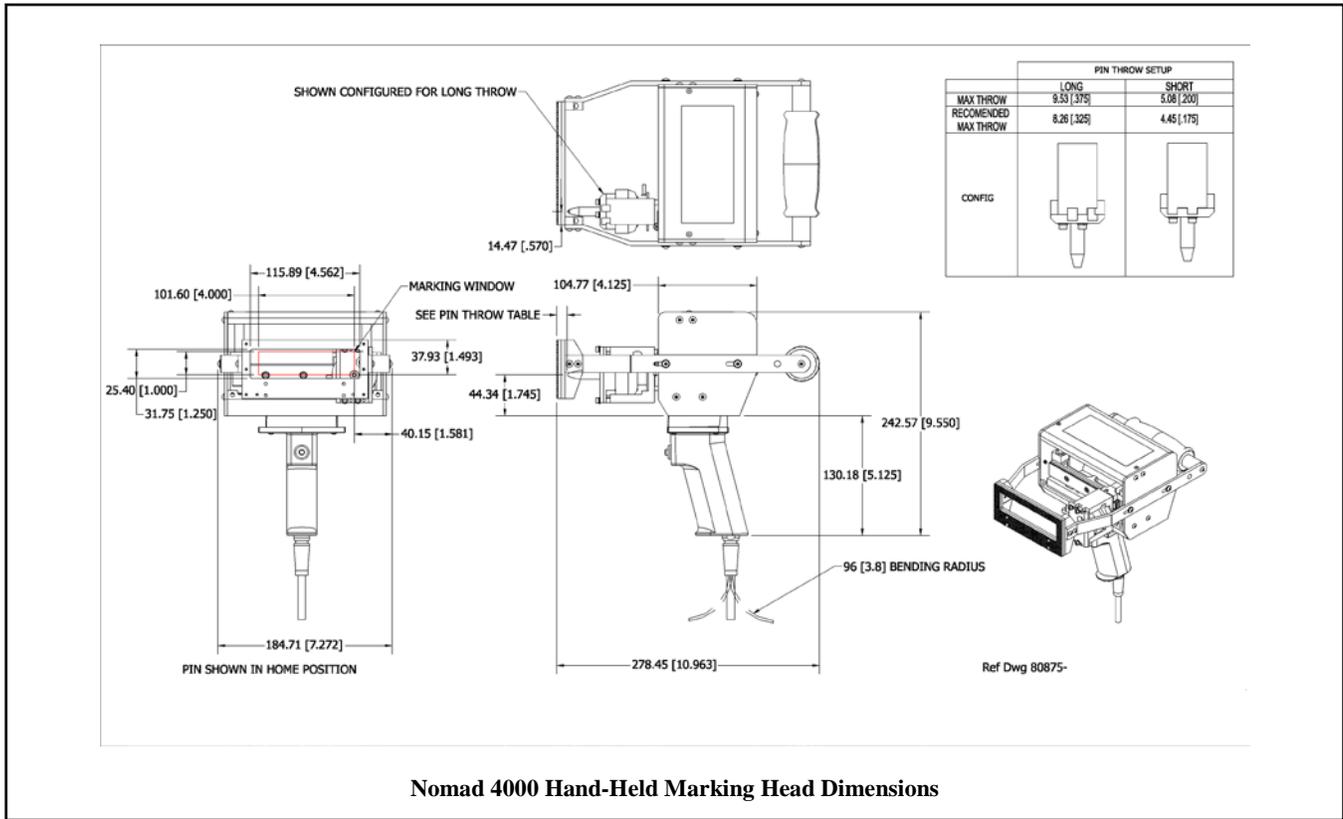
The **Marker Cable** Permanently connects the marker to the controller. The cable is 2 m (6.5 ft.) long and is pre-wired to the marking head.

NOMAD 4000 (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
- Bar Code Wand
- Logo/Font Generator Software
- Upgrade Utility Software

NOMAD 4000 Marking System



Nomad 4000 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 installation process. For complete installation instructions, refer to the *NOMAD 40000 Installation & Maintenance Manual* and the *NOMAD 4000 Operation Manual*.

CAUTION

The NOMAD 4000 is not a sealed unit. Protect it from potentially damaging conditions and contaminants. Ensure the marking system is electrically isolated from any devices that may generate extreme electromagnetic interference EMI.

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.).
3. Press the controller power button to ON (on front panel) to start the marking system software.
4. Load the needed pattern.
5. Adjust pin stroke for impact depth, as required
6. Place the marking head on the correct location and print pattern.

NOMAD 4000- MARKING HEAD

Specifications

The NOMAD 4000 marking head specifications are subject to change without prior notice.

Dimensions	see <i>NOMAD 4000 Hand-Held Marking Head Dimensions</i>
Rating	1 (I.P. 10)
Weight	3.00 kg (6.6 lb) marker only
Noise.....	81.4 dB (max); 73.1 dB (LEQ) See <i>Marking Noise</i> for details
Vibration.....	Does not exceed 2.5 m/s ² 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 Types.....	30° or 45° cone angle
Pin Type.....	Carbide with 30° or 45° cone angle
Pin Stroke (max.)	8.26 mm (.325 in) Long Throw 4.45 mm (.175 in.) Short Throw
Operating Temp.....	0° to 50°C (32° to 122° F), non-condensing
Humidity.....	10% to 80%

NOMAD 4000 MARKING HEAD *(continued)*

Marking Characteristics

The NOMAD 4000 can produce character sizes from 1.5 to 25 mm (.060 to 1.0 in.) increments. Characters can be rotated 359° in 1° increments with a printing resolution range from 4 dots/cm (10 dots/in.) to 31 dots/cm (80 dots/in.) for an engraved look. The depth of mark can be adjusted over a significant range by adjusting the pin stroke and/or adjusting the Depth parameter in the marking system software.

Marking Speeds

The system can mark 3.175 mm (.125 in.) high characters in the 5x7 font at a rate of 2 characters per second at a depth of .30 mm (.012 in.) in mild steel. Speeds will vary widely 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 NOMAD 4000 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 81.4 dB. The time-weighted average (LEQ) using the 3 db rule without threshold was 73.1 dB. Typical applications average a 20% to 30% duty cycle where the time-weighted average would not exceed 69.1 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.

Vibration Data

Total hand-arm vibration does not exceed 2.5 m/s².

Vibration tests were performed under controlled conditions imitating, as closely as possible, typical normal operation.

Conditions such as rigidity of the work piece, material, setting of the machine, etc. may vary in actual operational use and would alter the actual vibration level. Despite detailed guidance instructions provided with each machine, such conditions are beyond the control of Telesis and must remain the responsibility of the end user. Accordingly, you should conduct your own tests to establish safe working levels of use.

The vibration tests were conducted using the following parameters:

Pin Stroke.....	8 mm (.31 in) set for Long Throw
Marking Base.....	20 mm (.79 in) thick steel
Marking Surfaces.....	3 mm (.125 in) thick steel plate
Marking Mode.....	Dot
Text Marked.....	QWERTYUI12345678 5x7 font, 3mm (.12 in) characters

The following test results reflect the worst-case scenarios under the given test conditions.

Pistol Grip Handle		
VM	T _(EAV)	T _(ELV)
0.933 m/s ²	more than 24 hr	more than 24 hr

Padded (rear-mounted) Handle		
VM	T _(EAV)	T _(ELV)
0.87 m/s ²	more than 24 hr	more than 24 hr

where:

VM = hand/arm Vibration Magnitude.

T_(EAV) = time to reach the Exposure Action Value based on continuous marking.

T_(ELV) = time to reach the Exposure Limit Value based on continuous marking.

NOMAD 4000 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.



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

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	<i>refer to the NOMAD Controller Dimensions drawing</i>
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.

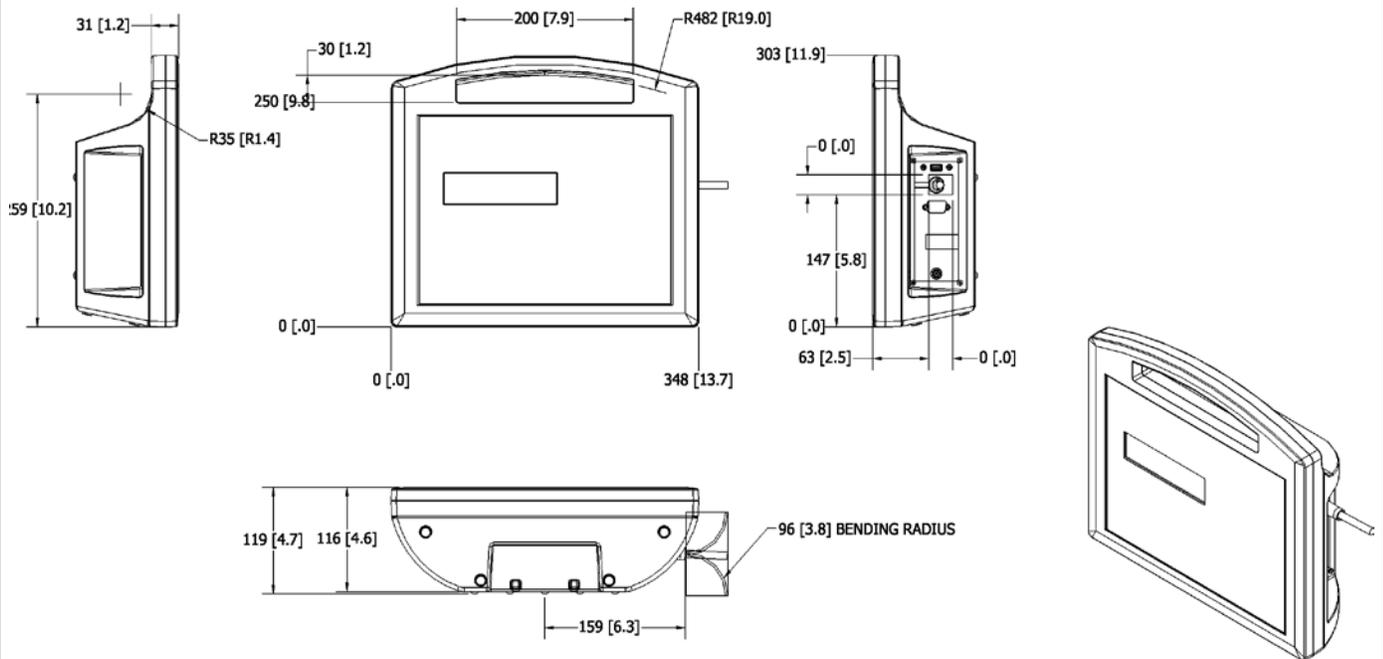
Contaminants. The non-vented NOMAD is rated NEMA® 1 (IP50) Where liquid contaminants are present, the possibility exists that these contaminants can be forced into the NOMAD controller and possibly result in failure. For that reason, in these types of environments, the controller should be protected.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

EMI Susceptibility. Although the system has been found to be in compliance with pertinent susceptibility standards, care should be taken when using near welders and other extreme generators of electromagnetic interference (EMI).

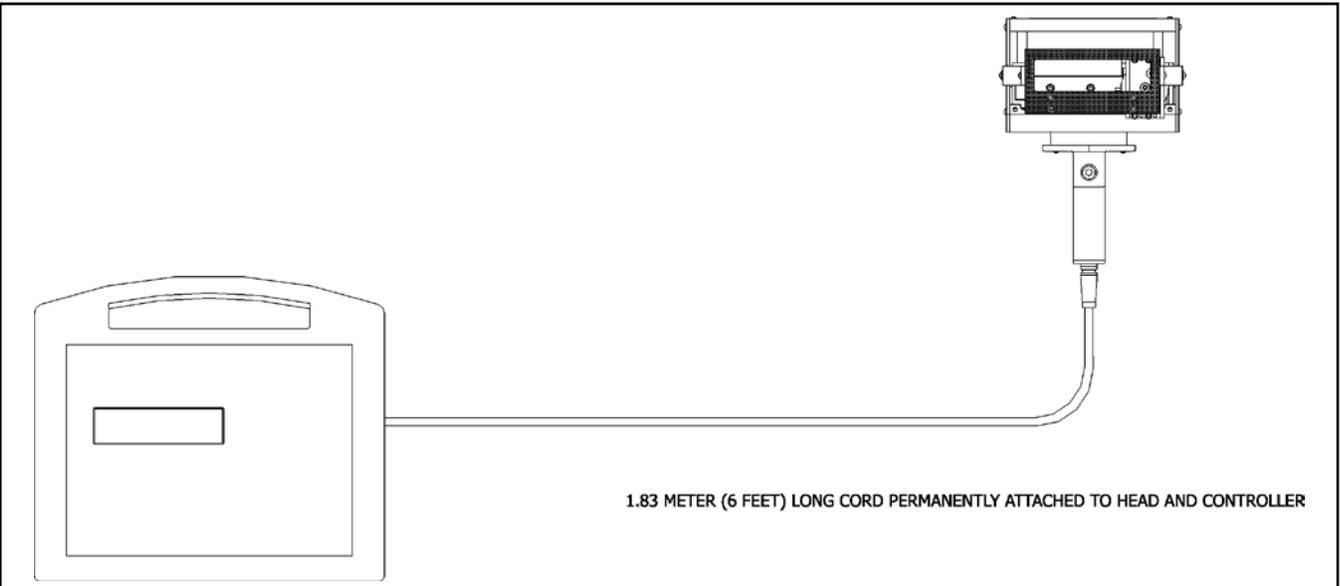
NOMAD -based System Software

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 4000 Marking System



NOMAD Controller Dimensions



NOMAD 4000 Controller and Head

NOMAD 4000 Marking System

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 Comm1 Port allows connection to remote serial devices such as a bar code scanner. See Serial 1 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. It is not recommended to use the NOMAD during the battery charging process. **Only use the battery charger provided by Telesis Technologies to insure proper battery function and safety.**

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.

TRADEMARKS

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