

Total Station Nivo Series

Nivo^{3.M} and Nivo^{5.M}

Instruction Manual

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Nikon

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Release Notice

This is the February 2009 (Revision A) release of the *Total Station Nivo Series Instruction Manual*. It applies to software release version 1.0.0 for the Total Station Nivo series.

Manufacturer

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Tokyo 144-0035 Japan

Notices

USA

FCC 15B Class B satisfied.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Warning – This equipment has been certified to comply with the limits for a Class B personal computer and peripherals, pursuant to Subpart B of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this equipment. Operation with non-certified personal computer and/or peripherals is likely to result in interference to radio and TV reception. The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

European Union

EU EMC Directive satisfied.

Authorized Representative in Europe

Trimble GmbH
Am Prime Parc 11
65479 Raunheim, Germany



Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la Class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Taiwan

Battery Recycling Requirements

The product contains a removable battery. Taiwanese regulations require that waste batteries are recycled.



「廢電池請回收」

Notice to Our European Union Customers

For product recycling instructions and more information, please go to:
www.trimble.com/environment/summary.html



Recycling in Europe

To recycle Trimble WEEE, call: +31 497 53 2430, and ask for the “WEEE associate,” or mail a request for recycling instructions to:
Trimble Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL

For optional Bluetooth unit

USA

FCC Part 15 Subpart/RSS-210, OET bulletin 65 supplement C satisfied



Caution – Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canada

RSS-210 Low Power Device

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

European Union countries, Iceland, Norway, Liechtenstein, Turkey, Swiss

EN300 328v1.7.1, EN50360 satisfied
Hereby, Nikon-Trimble Co., Ltd., declares that this instrument is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Declaration of Conformity available at <http://www.nikon-trimble.com/>

RF exposure compliance

- 1) To comply with FCC/IC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.
- 2) This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Safety

In this chapter:

- [Introduction](#)
- [Warnings and Cautions](#)
- [Laser Safety](#)

Introduction

For your safety, read this instruction manual carefully and thoroughly before using the Total Station Nivo series. Although Nikon products are designed for maximum safety, using them incorrectly or disregarding the instructions can cause personal injury or property damage.

You should also read the documentation for any other equipment that you use with a Nivo series instrument.

Note – Always keep the manual near the instrument for easy reference.

Warnings and Cautions

The following conventions are used to indicate safety instructions:



WARNING – Warnings alert you to situations that could cause death or serious injury.



CAUTION – Cautions alert you to situations that could cause injury or property damage.

Always read and follow the instructions carefully.

Warnings

Before using the instrument, read the following warnings and follow the instructions that they provide:



WARNING – Never look at the sun through the telescope. If you do, you may damage or lose your eyesight.



WARNING – Nivo series instruments are not designed to be explosion-proof. Do not use the instrument in coal mines, in areas contaminated with coal dust, or near other flammable substances.



WARNING – Never disassemble, modify, or repair the instrument yourself. If you do, you may receive electric shocks or burns, or the instrument may catch fire. You may also impair the accuracy of the instrument.



WARNING – Use **only** the battery charger and AC adapter that are supplied with the instrument. Do **not** use any other charger or you may cause the battery pack to catch fire or rupture.



WARNING – Do not cover the battery charger and AC adapter while the battery pack is being recharged. The charger must be able to dissipate heat adequately. Coverings such as blankets or clothing can cause the charger to overheat.



WARNING – Avoid recharging the battery pack in humid or dusty places, in direct sunlight, or near heat sources. Do not recharge the battery pack when it is wet. If you do, you may receive electric shocks or burns, or the battery pack may overheat or catch fire.



WARNING – Although the battery pack has an auto-reset circuit breaker, you should take care not to short circuit the contacts. Short circuits can cause the battery pack to catch fire or burn you.



WARNING – Never burn or heat the battery. Doing so may cause the battery to leak or rupture. A leaking or ruptured battery can cause serious injury.



WARNING – Before storing the battery pack or battery charger, cover the contact points with insulation tape. If you do not cover the contact points, the battery pack or charger may short circuit, causing fire, burns, or damage to the instrument.



WARNING – The battery is not itself waterproof. Do not get the battery wet when it is removed from the instrument. If water seeps into the battery, it may cause a fire or burns.

Cautions

Before using the instrument, read the following cautions and follow the instructions that they provide:



CAUTION – Use of controls, adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.



CAUTION – The tops of the tripod ferrules are very sharp. When handling or carrying the tripod, take care to avoid injuring yourself on the ferrules.



CAUTION – Before carrying the tripod or the instrument in the carrying case, check the shoulder strap and its clasp. If the strap is damaged or the clasp is not securely fastened, the carrying case may fall, causing personal injury or instrument damage.



CAUTION – Before setting up the tripod, make sure that no-one's hands or feet are underneath it. When the legs of the tripod are being driven into the ground, they could pierce hands or feet.



CAUTION – After mounting the instrument on the tripod, securely fasten the thumb screws on the tripod legs. If the thumb screws are not securely fastened, the tripod may collapse, causing personal injury or instrument damage.



CAUTION – After mounting the instrument on the tripod, securely fasten the clamp screw on the tripod. If the clamp screw is not securely fastened, the instrument may fall off the tripod, causing personal injury or instrument damage.



CAUTION – Securely fasten the tribrach clamp knob. If the knob is not securely fastened, the tribrach may come loose or fall off when you lift the instrument, causing personal injury or instrument damage.



CAUTION – Do not stack objects on the plastic carrying case, or use it as a stool. The plastic carrying case is unstable and its surface is slippery. Stacking or sitting on the plastic carrying case may cause personal injury or instrument damage.



CAUTION – The system in the instrument may stop functioning in order to avoid any errors in measurement when the instrument detects strong electromagnetic wave(s). If this is the case, turn off the instrument and remove the source of the electromagnetic wave(s). Then turn on the instrument to resume the work.

Rechargeable Lithium-ion (Li-ion) batteries



WARNING – Do not damage the rechargeable Lithium-ion battery. A damaged battery can cause an explosion or fire, and can result in personal injury and/or property damage.

To prevent injury or damage:

- Do not use or charge the battery if it appears to be damaged. Signs of damage include, but are not limited to, discoloration, warping, and leaking battery fluid.
 - Do not expose the battery to fire, high temperature, or direct sunlight.
 - Do not immerse the battery in water.
 - Do not use or store the battery inside a vehicle during hot weather.
 - Do not drop or puncture the battery.
 - Do not open the battery or short-circuit its contacts.
-



WARNING – Avoid contact with the rechargeable Lithium-ion battery if it appears to be leaking. Battery fluid is corrosive, and contact with it can result in personal injury and/or property damage.

To prevent injury or damage:

- If the battery leaks, avoid contact with the battery fluid.
 - If battery fluid gets into your eyes, immediately rinse your eyes with clean water and seek medical attention. Do not rub your eyes!
 - If battery fluid gets onto your skin or clothing, immediately use clean water to wash off the battery fluid.
-



WARNING – Charge and use the rechargeable Lithium-ion battery only in strict accordance with the instructions. Charging or using the battery in unauthorized equipment can cause an explosion or fire, and can result in personal injury and/or equipment damage.

To prevent injury or damage:

- Do not charge or use the battery if it appears to be damaged or leaking.
 - Charge the Lithium-ion battery only in a product that is specified to charge it. Be sure to follow all instructions that are provided with the battery charger.
 - Discontinue charging a battery that gives off extreme heat or a burning odor.
 - Use the battery only in equipment that is specified to use it.
 - Use the battery only for its intended use and according to the instructions in the product documentation.
-

Laser Safety

The Nivo series is a Class 2 laser instrument.

Nivo Series is a Class 2 Laser Product in accordance with: IEC60825-1, Am2 (2001): “Safety of Laser Products”

Precautions: To counteract hazards, it is essential for all users to pay careful attention to the safety precautions and control measures specified in the standard IEC60825-1 (2001-08) resp. EN60825-1:1994 + A11:1996 + A2:2001, within the **hazard distance** *); particularly on to “User’s Guide”.



WARNING – Only qualified and trained persons should be assigned to install, adjust and operate the laser equipment.



WARNING – Precautions should be taken to ensure that persons do not look directly, with or without an optical instrument, into the beam.



WARNING – Laser beam path should be located well above or below eye level wherever practicable.

Table 1.1 Specifications for laser emission

Laser pointer	
Wave length	630-680 nm
Output power	CW $P_o \leq 1 \text{ mW}$
Disatance meter	
Wave length	850-890 nm
Output power	Pulse $P_o \leq 6.4 \text{ W}$
Pulse width	< 5 ns
Laser plummet (Option)	
Wave length	635 nm
Output power	CW $P_o < 1.0 \text{ mW}$

Table 1.2 Conforming standards

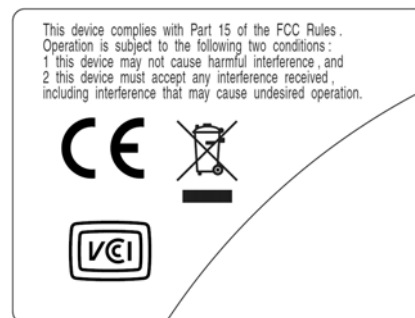
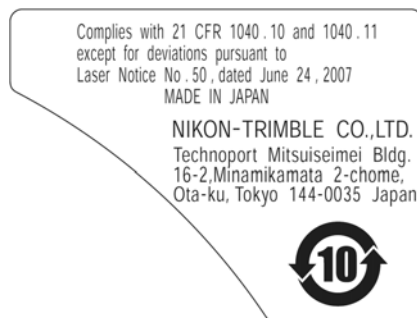
E.U.	EN60825-1/Am.2 : 2001 (IEC60825-1/Am.2 : 2001) Laser Pointer: Class 2 Distance Meter: Class 1 Laser plummet: Class 2 (Option)
USA	FDA21CFR Part 1040 Sec.1040.10 and 1040.11 (except for deviations pursuant to Laser Notice No.50, dated June 24, 2007)



Laser pointer



Laser plummet (Option)



Contents

	Safety	iii
	Introduction	iv
	Warnings and Cautions	iv
	Warnings	iv
	Cautions	v
	Rechargeable Lithium-ion (Li-ion) batteries	vi
	Laser Safety.	vii
1	Introduction.	1
	Welcome	2
	Parts of the Instrument	3
	Maintenance	5
2	Preparation	7
	Unpacking and Packing the Instrument	8
	Unpacking	8
	Packing	8
	Charging the Battery Pack	8
	Detaching and Re-Attaching the Battery Pack.	12
	Setting Up the Tripod	13
	Centering	13
	Centering using the optical plummet	13
	Centering using the laser plummet	14
	Centering using a plumb bob	15
	Leveling	15
	Sighting	16
	Setting the Measurement Mode and Preparing the Target	17
	Measurement with a prism	17
	Measurement in Reflectorless mode	18
	Preparing the Reflector Sheet	19
	Setting Up the Prism Reflector	20
	Adjusting the height of the tribrach adapter	21
	Changing the direction of the prism	21
	Setting the prism constant	21
	Setting the position of the target plate	22
3	Getting Started	23
	Turning the Instrument On and Off	24
	Turning on the instrument	24
	Turning off the instrument	24
	Changing Regional Configuration Pre-sets	25
	Display and Key Functions	26
	Status bar	28
	LCD backlight, Laser pointer, Beep sound and Contrast adjustment	30
	[DSP] key	31
	[MODE] key.	32
	[COD] key	33
	[HOT] key	34

Bubble indicator . . . . .	.36
Laser plummet . . . . .	.36
[USR] keys . . . . .	.37
[DAT] key. . . . .	.38
List Display . . . . .	.39
Inputting Data . . . . .	.39
Entering a point name or number . . . . .	.39
Entering a code . . . . .	.43
<i>Advanced feature: Searching for a code by using the first character</i> . . . . .	.44
Entering values in feet and inches . . . . .	.45
Jobs . . . . .	.45
Creating a new job . . . . .	.46
Measuring Distances . . . . .	.47
Sighting a prism reflector . . . . .	.47
Measuring distances. . . . .	.47
Measurement settings . . . . .	.48
4 Applications . . . . .	.51
HA Reset and Angle Operations . . . . .	.52
Setting the horizontal angle to 0 . . . . .	.52
Entering the horizontal angle . . . . .	.52
Recording a foresight point after repeat angle measurement . . . . .	.52
Horizontal angle hold . . . . .	.53
Station Setup . . . . .	.53
Setting up a station with known coordinates or azimuth. . . . .	.54
Setting up a station using multiple point resection . . . . .	.57
<i>Advanced feature: Viewing and deleting a measurement in resection</i> . . . . .	.59
Setting up the station quickly without coordinates . . . . .	.60
Determining station elevation . . . . .	.60
Checking and resetting the backsight direction . . . . .	.61
Two-point resection along a known line . . . . .	.62
Stakeout . . . . .	.64
Specifying the stakeout point by angle and distance . . . . .	.65
Specifying the stakeout point by coordinates . . . . .	.66
<i>Advanced feature: Specifying a stakeout list by range input</i> . . . . .	.68
DivLine S-O . . . . .	.68
RefLine S-O . . . . .	.69
Program Key . . . . .	.71
Measuring distance and offset values along a specified line . . . . .	.71
Measuring distance and offset values on the arc-curve . . . . .	.73
Remote distance measurement. . . . .	.75
Measuring remote elevation . . . . .	.77
Measuring distance and offset values on the vertical plane . . . . .	.78
Measuring distance and offset values on the slope . . . . .	.80
Recording Measurement Data. . . . .	.81
Recording data from any observation screen . . . . .	.81
Outputting data to the COM port . . . . .	.82
Measuring Offsets . . . . .	.83

	Measuring taped offsets . . . . .	.83
	Measuring angle offsets . . . . .	.84
	Two-prism pole . . . . .	.85
	Extending a line by horizontal angle offset . . . . .	.86
	Entering a horizontal distance after an angle-only shot . . . . .	.87
	Calculating a corner point . . . . .	.88
	Measuring circle offsets . . . . .	.89
	Extending the slope distance. . . . .	.90
5	Menu Key.	91
	Introduction.	92
	Job Manager	92
	Opening an existing job	92
	Creating a new job	93
	Deleting a job	94
	Setting the control job	94
	Displaying job Information	95
	Cogo	96
	Calculating angle and distance between two coordinates	96
	Calculating and manually inputting coordinates	98
	Calculating area and perimeter	100
	<i>Advanced feature: Entering a range of points</i>	<i>101</i>
	Calculating coordinates from line and offset	102
	Calculating coordinates using intersection functions	103
	<i>Advanced feature: Entering angle and distance offsets</i>	<i>107</i>
	Settings.	108
	Angle	108
	Distance	109
	Coordinate	110
	Power saving.	110
	Communications	111
	Stakeout.	111
	Unit	111
	Recording.	112
	Others settings	112
	Data	114
	Viewing records	114
	Deleting records	117
	Editing records.	119
	Searching records	122
	Entering coordinates	124
	Point name list and code list	124
	Communication	128
	Downloading data.	128
	Uploading coordinate data	129
	<i>Advanced feature: Editing the data order for upload</i>	<i>130</i>
	Uploading a point name list or code list	131
	1sec-Keys.	131

	MSR key settings	132
	DSP key settings	132
	USR key settings	132
	S-O key settings	133
	DAT key settings	133
	Calibration	134
	Time	134
6	Checking and Adjustment	135
	Adjusting the Electronic Level	136
	Checking and Adjusting the Circular Level.	136
	Checking and Adjusting the Optical/Laser Plummet.	136
	Zero Point Errors of Vertical Scale and Horizontal Angle Corrections.	137
	Checking	137
	Adjusting	138
	Checking the Instrument Constant.	139
	Checking the Laser Pointer	140
7	Specifications	141
	Main Body	142
	Telescope	142
	Measurement range	142
	Distance precision	142
	Measurement intervals	143
	Angle measurement	143
	Tilt sensor.	143
	Tangent screw	143
	Tribrach.	143
	Level	144
	Optical plummet	144
	Optional laser plummet.	144
	Display and keypad	144
	Connections in the base of instrument	144
	Battery pack	145
	Environmental performance	145
	Dimensions	145
	Weight	145
	Environmental protection	145
	Standard Components	146
	External Device Connector	146
8	System Diagrams	149
	System Components	150
9	Communications	153
	Uploading Coordinate Data	154
	Settings	154
	Record format	154
	Uploading Point Lists and Code Lists	156
	Settings	156

	File format	156
	Data example	157
	Downloading Data	158
	Settings	158
	Nikon raw record formats	158
	SDR2x and SDR33 record formats	161
	Data examples	165
10	Error Messages	169
	Cogo	170
	Communications	170
	Data	171
	Job Manager	172
	Programs	172
	Recording Data	173
	Searching	174
	Settings.	174
	Stakeout	174
	Station Setup	175
	System Error	176

Introduction

In this chapter:

- [Welcome](#)
- [Parts of the Instrument](#)
- [Maintenance](#)

Welcome

Thank you for purchasing this Nikon product.

This instruction manual was written for the users of Total Station Nivo series instruments. Before you operate a Nivo series instrument, read this manual carefully. In particular, pay attention to the warnings and cautions that appear in the Safety section at the front of the manual. Before you begin, you should also read the maintenance instructions. For more information, see [Maintenance, page 5](#).

Parts of the Instrument

Figure 1.1 and Figure 1.2 show the main parts of the Nivo series instrument.

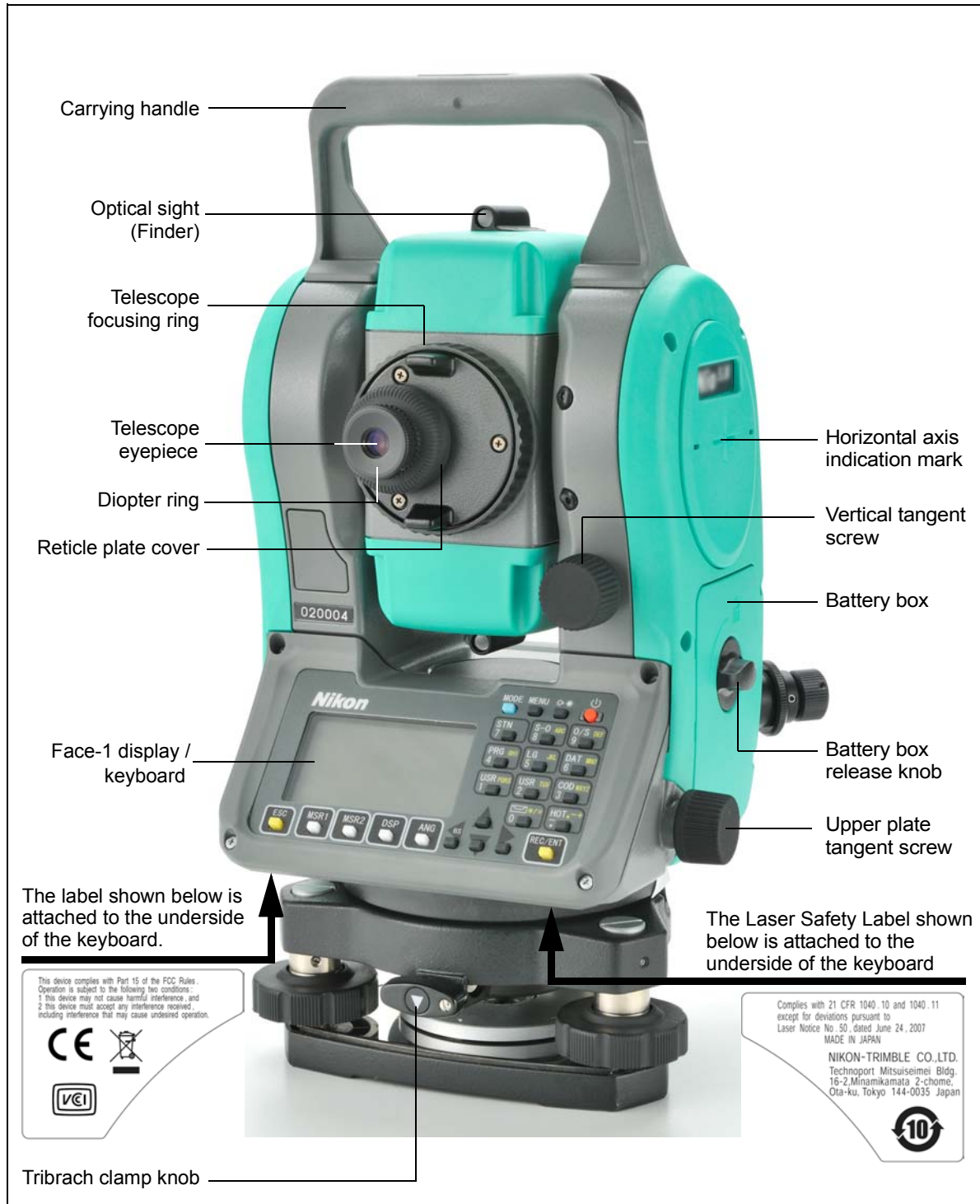


Figure 1.1 Total Station Nivo series – Face-1

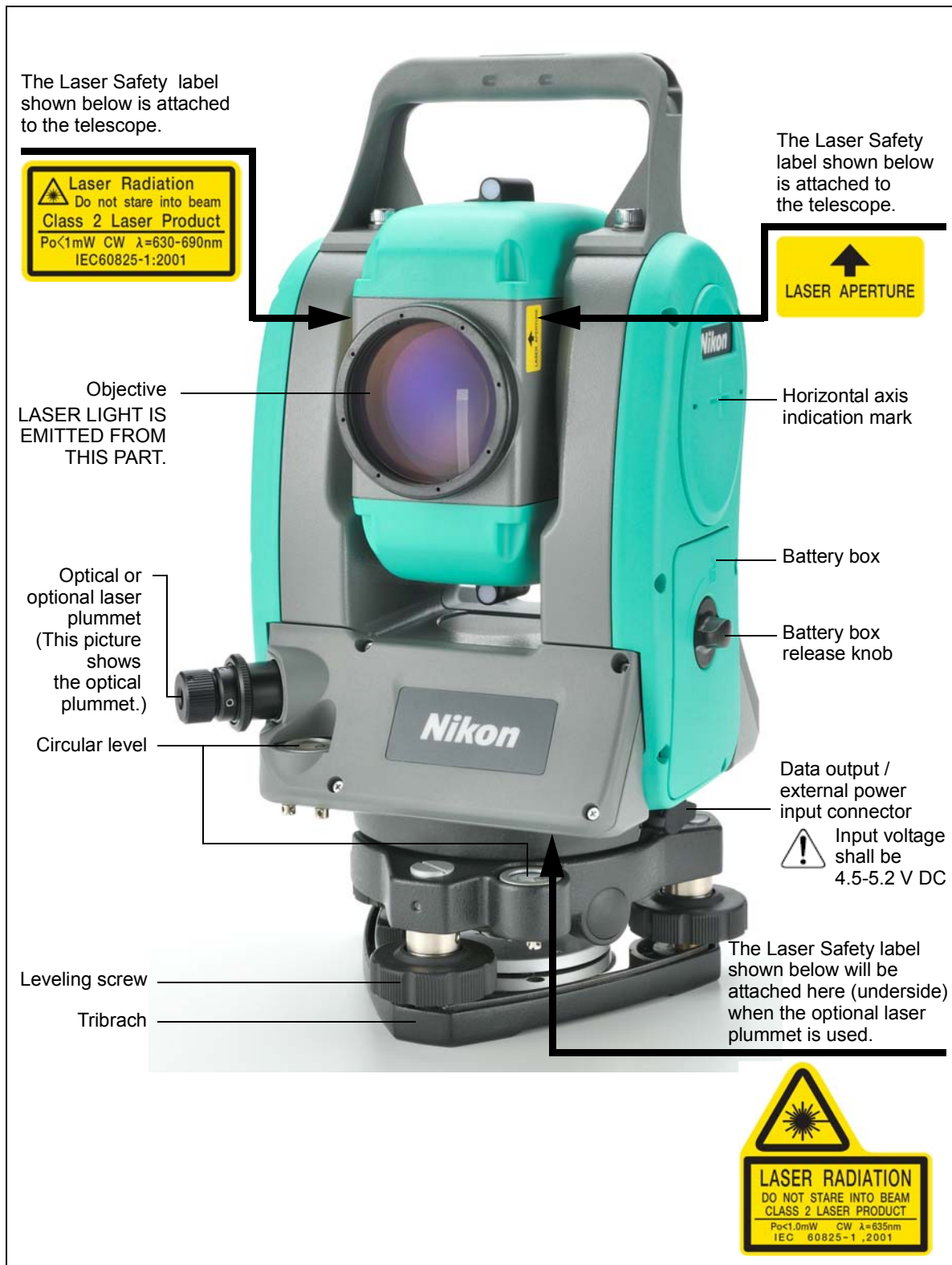


Figure 1.2 Total Station Nivo series – Face-2

Maintenance

Before using the instrument, read and follow the following maintenance instructions:

- Do not leave the instrument in direct sunlight or in a closed vehicle for prolonged periods. Overheating the instrument may reduce its efficiency.
- If the Nivo series instrument has been used in wet conditions, immediately wipe off any moisture and dry the instrument completely before returning the instrument to the carrying case. The instrument contains sensitive electronic assemblies which have been well protected against dust and moisture. However, if dust or moisture gets into the instrument, severe damage could result.
- Sudden changes in temperature may cloud the lenses and drastically reduce the measurable distance, or cause an electrical system failure. If there has been a sudden change in temperature, leave the instrument in a closed carrying case in a warm location until the temperature of the instrument returns to room temperature.
- Do not store the Nivo series instrument in hot or humid locations. In particular, you must store the battery pack in a dry location at a temperature of less than 30 °C (86 °F). High temperature or excessive humidity can cause mold to grow on the lenses. It can also cause the electronic assemblies to deteriorate, and so lead to instrument failure.
- Store the battery pack with the battery discharged.
- When storing the instrument in areas subject to extremely low temperatures, leave the carrying case open.
- When adjusting the leveling screws, stay as close as possible to the center of each screw's range. The center is indicated by a line on the screw.
- If the tribrach will not be used for an extended period, lock down the tribrach clamp knob and tighten its safety screw.
- Do not use organic solvents (such as ether or paint thinner) to clean the non-metallic parts of the instrument (such as the keyboard) or the painted or printed surfaces. Doing so could result in discoloration of the surface, or in peeling of printed characters. Clean these parts only with a soft cloth or a tissue, lightly moistened with water or a mild detergent.
- To clean the optical lenses, lightly wipe them with a soft cloth or a lens tissue that is moistened with alcohol.

- The reticle plate cover has been correctly mounted. Do not release it or subject it to excessive force to make it watertight.
- Before attaching the battery pack, check that the contact surfaces on the battery and instrument are clean.
- Securely press the cap that covers the data output/external power input connector terminal. The instrument is not watertight if the cap is not attached securely, or when the data output/external power input connector is used.
- The carrying case is designed to be watertight, but you should not leave it exposed to rain for an extended period. If exposure to rain is unavoidable, make sure that the carrying case is placed with the Nikon nameplate facing upward.
- The battery pack contains a Lithium-ion battery. When disposing of the battery pack, follow the laws or rules of your municipal waste system.
- The instrument can be damaged by static electricity from the human body discharged through the data output/external power input connector. Before handling the instrument, touch any other conductive material once to remove static electricity.
- Be careful not to pinch your finger between the telescope and trunnion of the instrument.

