

Metrology Resource Co.

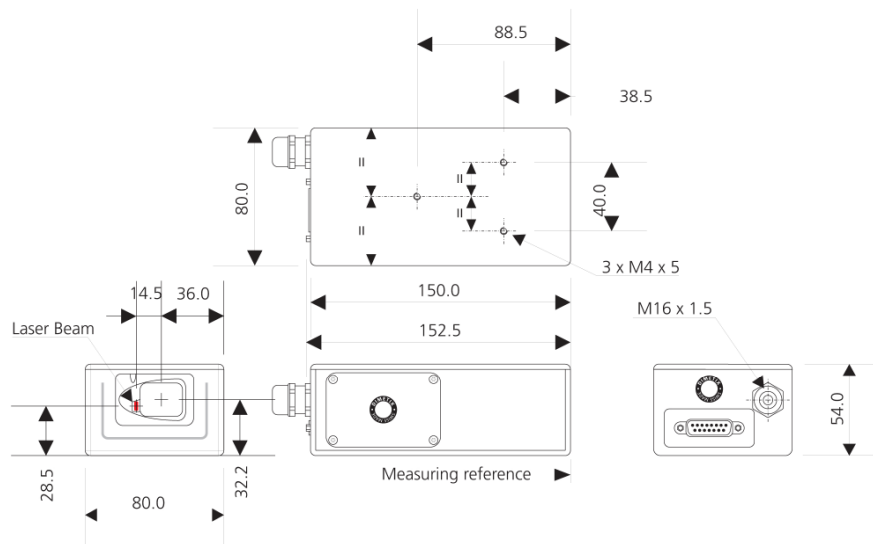
PO Box 396, Ortonville, Michigan, 48462

Phone: 248-628-8671 Fax: 248-274-3088

MRL- ML1 Manual (V1-1)



MRL -ML1 DIMENSIONS



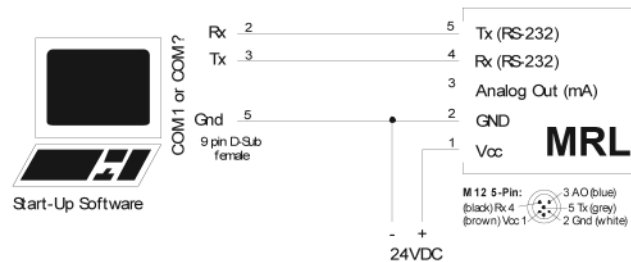
1. First Start-Up

The MRL-ML1 is initially configured with a connection cable (see accessories), a power supply and the easy to apply "Start-Up Software". The "Start-Up Software" for configuration is available as a free download on our web site: www.metrologyresource.com

Connect the MRL-ML1 to a PC/Laptop using the RS-232 interface, define and download the configuration required and install the sensor in your application.

2. Connection for configuration

Use our standard connection cable. Please note, that some "USB to RS-232 converters" can cause problems.



3. Configuration of the MRL

To achieve the maximum possible analog output accuracy, the span should be configured to as short as possible. For example, if you measure distances of 22 to 29 meters, you should configure a span of 20m to 30m (corresponding to 0/4...20mA).

	Default configuration	Configuration limits
minimum output current	4mA	0 or 4mA
Error output current	0mA	0...20mA
minimum Distance	0mm	0...30'000mm
maximum Distance	10'000mm	1000...30'000mm
Measurement sample rate	1s	0...65'000s

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4. Command Set (if not using the free "Start-Up Software")

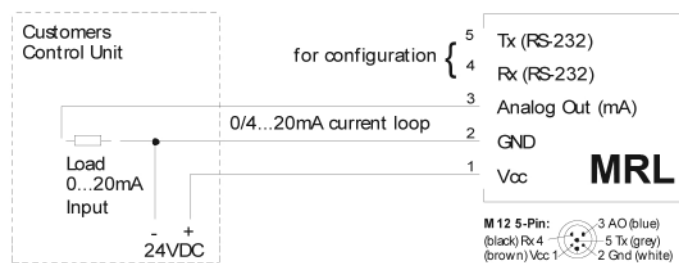
Baud Rate: 19'200; Data Bits: 7; Parity: even; Stopbits: 1

Command Terminator is: <CR> <LF> (Carriage return, Line feed)

The first two characters in the commands are s0 (s, zero)

For further information about the command-set read the COM- trace in our "Start-Up Software".

5. Connection diagram MRL to control unit



6. Measuring conditions

The MRL-ML1 is an optical instrument, where the operation is influenced by environmental conditions. Therefore, the measuring range may vary. The following factors may influence the range and speed of measurements.

Key	Factor s increasing range and/or distance	Factors reducing range and/or distance
Target Surface	Bright and/or reflective surfaces such as the accessory target plate	Matt and/or dark surfaces – green/blue/black surfaces
Airborne particles	Clean air	Dust, fog, mist, heavy rain, heavy snow
Sunshine	Darkness	Bright sunshine on the target

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7. Product specifications

Measuring accuracy MRL	± 3.0mm @ 2sigma Analog Output 0.3% full scale, including temperature drift and target properties
Typical repeatability	approx. 1.5mm
Measuring range (on natural surfaces)	0.05 to 30 m (matt, dark surfaces up to about 20m)
Measuring reference	from front edge (see picture schematic)
approx. Ø of laser spot	6mm @5m; 7mm @10m; 15mm @30m
Time for a measurement	0.4 to approx. 4 sec
Light source	Laser diode visible 620-690 nm (red) IEC 60825-1:2001; Class 2 FDA 21CFR 1040.10 and 1040.11 Beam divergence:0.16 x 0.6 mrad Pulse duration: 0.45x10 ⁻⁹ s Maximum radiant power: 0.95 mW
Laser Life Time ¹⁾	> 50'000h @ 20°C
ESD	IEC 61000-4-2 : 1995 +A1 +A2
Power supply	24V DC+/-10%, 0.1A max.
EMC	EN 61000-6-4; EN 61000-6-2
Operating Temperature ²⁾	-10 °C to +50 °C
Storage Temperature	-40 °C to +70 °C
Environment	Humidity 0...80%RH non-condensing; no aggressive vapors
Dimensions	106 x 62 x 45 mm
Weight	280g
Degree of Protection	P65; IEC60529 (protected against ingress of dust / water)
Interface	1 RS-232 Interface to configure the sensor 1 program. analog output 0/4 .. 20mA

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8. Error codes

No.	Format	Meaning and elimination
200	@E200	Device startup information (only for error stack), successful power on cycle or power-line not stable
203	@E203	Wrong syntax in command, prohibited parameter in command entry or non-valid result, check command
210	@E210	Not in tracking mode, start tracking first
211	@E211	Sampling too fast for the used target, configure a slower sampling rate (or use a more reflective target)
212	@E212	In Tracking Mode, command not executable, Stop tracking first with s0c-command
220	@E220	Error on serial communication, check com settings
234	@E234	Distance out of range, Measure a distance within the specified limits
252	@E252	Temperature too high, cool down the sensor
253	@E253	Temperature too low, heat up the sensor
255	@E255	Received signal too low, use a brighter target or a target plate
256	@E256	Received signal too high, use a darker target, mind reflective parts along the laser beam
257	@E257	Too much background light, cover bright light sources, use a darker target, mind reflective parts along the laser beam
260	@E260	Strange distance result, maybe distance jump during measuring cycle, measure to a defined target
not listed		Contact Metrology Resource

9. Accessories

On our web site www.metrologyresource.com you can find some helpful accessories for the MRL-ML1,

- configuration cable 3m (5000 201) - Connection cable 5m (5000 202)
- Accessory for Starter Kit (5000 592) - Alignment jig (5500 215)

10. Safety instructions

The MRL-ML1 is made to be integrated into technical systems. Basic technical training is therefore essential. This device should only be operated by trained personnel. If the MRL-ML1 is part of a system, the manufacturer of such a system is responsible for all safety-related issues, such as the manual, labeling and instruction.

Laser classification

The MRL-ML1 produces a visible laser beam, which emerges from the front of the instrument. It is a Class 2 laser product in accordance with:

1. IEC60825-1 (2001) "Radiation safety of laser products"
2. EN60825-1 (2001) "Radiation safety of laser products"

It is a Class II laser product in accordance with:

1. FDA 21CFR 1040.10 and 1040.11 (US Department of Health and Human Service, Code of Federal Regulations)

Laser Class 2/II products:

Do not stare into the laser beam or direct it towards other people unnecessarily. Eye protection is normally afforded by aversion responses including the blink reflex.

WARNING: Looking directly into the beam with optical aids (binoculars, telescopes) can be hazardous.

Precautions: Do not look into the laser beam. Make sure the laser is aimed above or below eye level. (Particularly with fixed installations, in machines, etc.).

CAUTION: Looking into the laser beam may be hazardous to the eyes.

Precautions: Do not look into the laser beam. Make sure the laser is aimed above or below eye level (particularly with fixed installations, in machines, etc.).

Service information

All warranty returns and repairs have to be returned with a RMA Report.

Disclaimer

Information in this document is subject to change without notice and does not represent a commitment on the part of Metrology Resource Co.

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