LASER RANGE FINDER MODULE
LRF MOD 4EC

105 Sparks Ave., Toronto, ON, M2H 2S5, Canada

IMPORTANT INFORMATION
Read prior to activation

You have just purchased a sophisticated electro-optical device that emits invisible laser radiation. To operate it properly, please read this manual carefully.

- **NEVER** direct laser beam at the eyes of people or animals
- **NEVER** aim the unit at the Sun or bright sources of light
- **NEVER** subject the unit to impacts
- **NEVER** transport the unit without its case
- **NEVER** disassemble the unit. This may be hazardous for you due to high voltage currents in the system
- **ALWAYS** keep the unit out of children's reach
- **ALWAYS** store the unit in a dry place
- **Caution** - use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure
- **Caution** - use of optical instruments such as binoculars, loupes, mirrors, lenses, etc. with this product increases eye hazard.
- **Caution** - avoid access of direct sun light into eye-piece optics for more then 5 sec consistently.
- **Note**: Avoid eye exposure to direct laser beam or its close reflection

CONTENTS

**CAREFULLY READ ALL THE INSTRUCTIONS
BEFORE USING!**

**FAILURE TO OBEY THE INSTRUCTIONS WILL
VOID THE WARRANTY AND MAY CAUSE
INJURY!**

1. BRIEF DESCRIPTION

The LRF Modules use the same electronics and optics as
rangefinder monoculars and binoculars. These modules can add
various range finding capabilities into host systems: distance &
speed measurement, azimuth and elevation measurement.

The modules have a built-in computer interface, which enables
immediate data acquisition by any system with standard serial
interface. Depending on exact model, customer has a choice of
various incorporated features, including, but not limited to gating
capability, fast scan mode, speed measurement, object selection
and more.

Typically a rangefinder module becomes a part of:
- Thermal imagers
- Day/night surveillance systems
- Airborne optical systems.

Both modules can be integrated into a bigger observation system.
The Modules comply with CFR 21, Part 1040.10

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Principle of work

The Modules send invisible, eye safe laser pulses to the target. Pulses reflected from the target are captured and processed by the digital circuitry. The time-of-flight delay between the sent and received pulses allows calculating the distance to the target.

A built-in digital compass/inclinometer of MOD 4EC measures target's azimuth and elevation simultaneously with ranging.

Key Features

- Selection of the first, last or the most reflective target
- Distance is displayed in meters or yards, speed is displayed in km/h or MPH, azimuth and elevation are displayed in degrees or mils
- Original digital circuitry allows ranging through most types of glass, bushes and other obstacles
- Two reticle shapes: -¦- or □
- Built-in digital accurate compass/inclinometer, angles are displayed in degrees or mils.
- On-board memory keeps results of the last 10 measurements, that can be recalled

2. DEVICE APPEARANCE
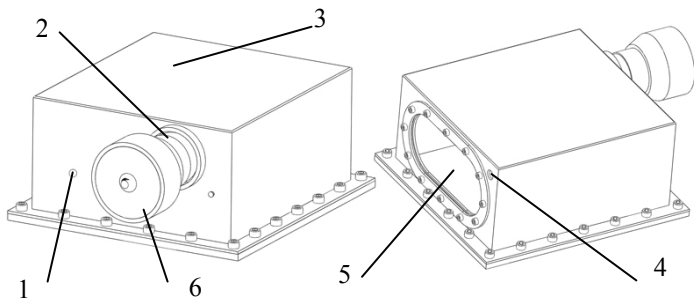
1 – Communication connector   2 – Detachable eye-piece
3 – LRF cover   4 – Desiccator
5 – Optical window   6 – Detachable camera

Fig. 1. MOD 4EC general view
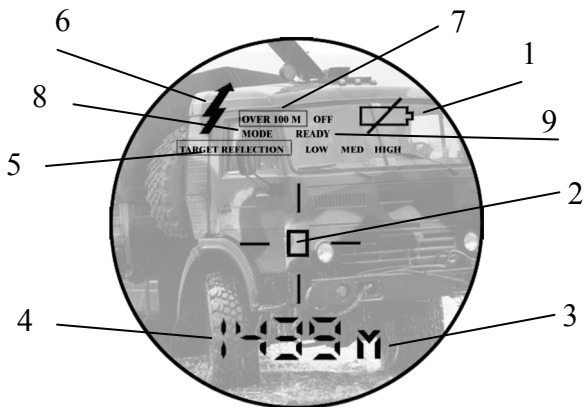
Fig. 2. Liquid Crystal Display view
through the eyepiece

1 – Low battery indicator
3 – Units of measurement
5 – Target quality indicator
7 – Gating indicator
9 – Ready mode indicator

2 – Reticle (either -¦- or □)
4 – Measurement result
6 – Laser active indicator
8 – Setup mode indicator

3. DELIVERY SET

Standard delivery set

The unit is supplied in the following assembly:

	Qty
LRF MOD 4EC	1
Eyepiece	1
USB camera	1
Compact disk with software	1
Computer/power cable	1
Operation manual	1
Warranty card	1
Hard case	1

Connectors:

Data/power connector	LEMO Push-Pull Connector
	FGG.0B.309.CLAD52

Data and power connectors can be modified per individual order.

Optional accessories

GPS cable

Remote control module

Download from Www.Somanuals.com. All Manuals Search And Download.

4. SPECIFICATIONS

Range Finder

Laser	Class 1, eye safe, 905 nm
Measuring range	16 m – 4,000 m
Accuracy	± 1 m
First, last and auto target selection	Yes
Meters/Yards display	Yes
Last 10 readings recall	Yes
Reticle	-¦- or □
Target quality indicator	Yes
Gating capability, m	100 - 7,000; 100 m step

Speed measurement

Measured speed range	5 – 400 km/h / 3-250 mph
Accuracy, km/h or mph	±2

Compass and inclinometer (MOD 4EC only)

Measured azimuth range	360°
Accuracy	±1°
Measured elevation range	±60°

Interface

RS 232 interface.

Power

External power requirement	9V DC, 300 mA

The unit is fully operational when voltage is higher than 7V. A '**LOW BATTERY'** warning is displayed when voltage falls below 7.2V.

Environmental

Operational temperature range	-25 / +50ºC (-13 / +122ºF)
Storage temperature range	-45 / +65ºC (-49 / +149ºF)

Mechanics

Weight without eyepiece	2,370 g
Weight with eyepiece	2,450 g
Dimensions without eyepiece	214x195x94 mm
Dimensions with eyepiece	238x195x94 mm

5. OPERATION INSTRUCTIONS

Maximum distance

Though maximum measurement distance depends on target reflectivity, weather conditions and other conditions, for most targets the unit will provide accurate ranging for up to 3,000 meters. In good conditions a highly reflective target can be measured up to 4,000 meters.

Target reflectivity depends on its color, surface finish, size, shape, position in relation to the laser beam, etc. Bright target colors are more reflective than dark ones. A polished surface is more reflective than a rough one. Larger targets reflect better than small ones. Ranging a target perpendicular to the laser beam provides better results than the one positioned under a sharp angle to the beam.

Weather conditions that influence air transparency (rain, fog, snow, mist) reduce maximum range. Bright sunny days will reduce performance as well, as IR sun radiation may cover reflected laser pulses.

While the unit will measure through many glass types, measuring through glass may reduce accuracy and range.

Module controls

Modules can be fully controlled via RS-232 connector and/or with buttons on remote control. The control procedures are identical and interchangeable.

The correspondence between the pressing of the buttons and the signals sent via RS-232 is described in *Interconnectivity,* chapter 7.

The rest of this manual describes measurement procedures and setting measurement parameters through pressing of the buttons.

Measurement procedure

When the Module is off the LCD is blank. To activate it press and hold for one second the Action (A) button. At start the module comes into the *Ready to Measure* mode indicated by the word 'READY' on the display.

Pressing the Action button in the *Ready to Measure* mode initiates measurement. The result of the measurement is displayed in a form that depends on the measurement parameters (see Setup Mode).

Note:

- If more than one parameter is chosen to measure, e.g. distance and azimuth, the results will replace each other on the display every half a second.
- If the target is located below the unit the result of vertical measurement (elevation or height) will be preceded with minus ("-") sign.
- If results of angular measurements can not be interpreted by the unit an error codes 444 (for azimuth) or 99 (for elevation) will be displayed. Repeat the measurement. If error codes appear again – reboot the unit by switching it off and on again.

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Target selection logic

On its way towards the target, laser beam may reflect from various objects, thus decreasing ranging accuracy. The smaller, the farther, and the less reflective is the target – the higher is the possibility of obtaining an incorrect measurement.

To improve accuracy the unit has a built-in target selection logic, which allows choosing what target to range: the nearest ('first'), the farthest ('last'), or the most reflective ('auto').

This mechanism helps selecting the target when ranging from behind the bushes, wires, through the falling snow, or in similar conditions. Similarly it enables ranging a target in front of a bigger object, such as a wire in front of the wall.

Note: Even with target selection logic the unit may not always be able to range the desired target as its reflectivity may be too low to produce enough laser beam reflections for statistically reliable calculation. A warning will be displayed if result is not statistically reliable. See more about target reflectivity in *Additional display information* (0). This information will not be transferred via RS-232.

Individual Measurement and Scanning regimes

The unit can operate in two regimes: (1) *Individual Measurement* and (2) *Scanning*. In the *Individual Measurement* regime the unit performs single measurement when the A button is pressed shortly, in the *Scanning* regime the unit repeatedly measures and displays results every second while the A button is pressed.

To activate the *Scanning* regime press and hold the A button in Ready mode. The unit will work in the *Scanning* regime while the A button is pressed.

Scanning or *Individual Measurement* regimes are available for any selected mode of measurement. When two parameters are measured in the *Scanning* regime though both will be quickly displayed, the second one may be difficult to register by eye. Nevertheless all data is recorded and may be recalled (see *Data Recall* mode for details.)

Operation and service modes

The unit has the following modes of operation:

- **Ready to Measure** – to perform measurements

    (Quick link to the **Standard1** and **Standard2** sets of measurement parameters appears in mode selection menu for convenience and does not constitute a separate mode)

- **Setup** – to modify the *Ready to Measure* mode parameters,
- **Gating** – to set a minimum distance of measurement,
- **Data Recall** – to recall the last 10 measurement results,
- **Data Clearance** – to clear measurement results.

In the *Setup* mode four parameters of measurement can be set; these parameters define:

1. What the unit measures: distance or azimuth or elevation or all measurements at once,

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2. In what units result of distance measurement is displayed: meters or yards, degrees or mils, km/h or mph,

3. What reticle shape is visible: rectangular or crosshair, and

4. Which target is selected: first, last or most reflective (see the *Target selection logic* (5.4) for more details).

The *Setup mode* is described in more detail below.

The unit has two standard sets of the *Ready to Measure* mode parameters:

- **Standard1**: distance is displayed in meters, azimuth and elevation are displayed in degrees, crosshair reticle is visible, auto target selection is used,

- **Standard2**: distance is displayed in meters, azimuth and elevation are displayed in mils, crosshair reticle is visible, auto target selection is used,

- **Code 8** sets the same set of measurement parameters as the Standard1, except for distance measurement in yards.

At start the unit assumes the *Ready to Measure* mode with measurement parameters inherited from the previous setup. At manufacturing stage the unit is set up into Standard1 set of measuring parameters.

Mode switching and tuning

Pressing the Mode (M) button in the *Ready to Measure* mode switches the unit between modes of operation:

- *Ready to Measure* – **Ready** (9, Fig. 2) is displayed

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- Quick link to the Standard1 set of measurement parameters (display name: **Std1**),

- Quick link to Standard2 set of measurement parameters (display name: **Std2**),

- *Setup* mode (display name: **COdE**),

- *Gating* mode (display name: **GAt**),

- *Data Recall* mode (display name: **rEc**),

- *Memory Clearance* mode (display name: **cLr**),

- *Interface selection* mode (display name: **-PC-** or **PLGr**).

Flashing display name indicates the mode which can be selected by pressing the A button.

The *Setup, Gating selection, Data Recall* and *Interface selection* modes have submenus, so when the A button is pressed to select these modes the unit automatically enters the corresponding submenu. In the same way as with the mode switching, the M button switches between the submenu items and A selects the needed one. When the A button is pressed from the submenu the unit comes into the *Ready to Measure* mode with the selected parameter.

If no button is pressed for 8 seconds the unit leaves the current mode, in the *Ready* mode it switches off. Next time the unit is turned on it assumes the last chosen combination of the four *Ready to Measure* mode parameters.

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Note: On a special request a menu of a particular unit can be simplified to show only required modes.

Setup mode

To modify the *Ready to Measure* mode parameters:

- Enter the Setup mode.

  With word *Ready* on the display press the M button till display name COdE is displayed and press the A button.

- Select the desired parameter modification (see table below).

  Press the M button till the code name of the desired parameter is displayed and press A button.

To leave the *Setup* mode without changing measurement parameters press and hold the M button for two seconds. This works like the computer Esc key. The rangefinder will then keep the last set of parameters and return to the *Ready to Measure* mode.

Mode	Display name	Distance	Speed	Azimuth	Elevation	Reticle	Target selection logic
Ready to Measure	**Ready**	As set at previous session					
Standard1	**Std** 1	m		Deg	Deg	-|-	Auto
Standard2	**Std** 2	m		Mils	Mils	-|-	Auto

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Mode	Display name	Distance	Speed	Azimuth	Elevation	Reticle	Target selection logic
Setup	**COdE**	Entrance into the Setup mode					
	Cd1 **M**	m					NC
	Cd2 **Y**	yd					NC
	Cd3 **- °**			Deg			NC
	Cd4 **– ⚲**			Mils			NC
	Cd5 **– °**				Deg		NC
	Cd6 – ⚲				Mils		NC
	Cd7 – ⚲				m		NC
	Cd8 **– ⚲**	yd		Deg	Deg	-¦-	Auto
	Cd9 **-¦-**	NC				-¦-	NC
	Cd 10 □	NC				□	NC
	Cd 11	NC					Last
	Cd 12	NC					First
	Cd 13	NC					Auto
	Cd 14^KMH	NC	kmh	NC			
	Cd 15^MPH	NC	mph	NC			

Mode	Display name	Distance	Speed	Azimuth	Elevation	Reticle	Target selection logic
	Cd 16	Display test					
	Cd 17	Compass calibration					
Gating	GAt	Entrance into gating mode					
Data Recall	**rEc**	Recalls last 10 measurement sets					
Data Clearance	**cLr**	Clears all recorded data					
Interface format	**-PC-** or **PLGr**	Selects PC or PLGR data format for output port					

Empty field means the parameter is not measured in this mode, NC means 'no change' to the measurement parameter setting.

Once set, the mode parameter is stored in on-board memory and will be kept current until reset in the *Setup mode*.

Choosing **Cd** 16 in the Setup mode will cause all display segments and indicators to flash for 8 seconds. Flashing can be interrupted by pressing either button.

Compass calibration

If the Module was exposed to a strong magnetic field or was not in use for a long time, the compass accuracy may diminish.

To bring the compass into working condition:

- Select **Cd 17** in the *Setup mode*
- Keeping the unit horizontally, perform one full rotation around vertical axis within half a minute and then one full rotation around vertical axis with device upside down during half a minute.
- If one rotation does not restore calibration – perform two rotations.

The normal compass functioning will be restored.

Depending on the version of the on-board software, during calibration LCD will show either time countdown in seconds from 59 to 1 or flashing word **CAL**.

To ensure azimuth measurement accuracy calibrate compass after changing the battery.

Interface format

The unit can output measurement data via RS-232 port in either a proprietary protocol or in the format accepted by PLGF/DALGR. The selected format will be indicated on the LCD with display names **PLGr** or **-PC-**.

To select the required data transfer format:

- Select **PLGr** (**-PC-**) in the *Setup* mode

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- Pressing the A button will activate shown on the LCD communication format.

Gating mode

In this mode the gating function is activated: user can set the minimal distance to the target; reflection from any object closer than the gating distance will be ignored.

The *Gating* feature helps measuring remote targets in adverse atmospheric and environmental conditions by eliminating reflections from snowflakes, raindrops, industrial wires, branches, etc. At the same time, if gating distance is set incorrectly, you can remove the desirable object from measurement range.

To enter the gating mode press the A button when GAt is displayed. Minimal gating distance of 100 m will be initially set, further pressing the M button will increase gating distance by 100 m up to 7,000 m. When the desired distance is reached – select it by pressing A button.

The *Gating* distance can potentially be set longer than the maximum measuring range. The device will not measure anything then. To deactivate gating choose one of preset modes that do not include gating (for example: Standard1, Standard2, Code1, Code2, etc.).

Note: the *Gating* distance can only be increased. To exit gating selection cycle without setting any gating distance press the M button 70 times or hold the M button for 2 seconds.

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Data Recall mode

In the *Data Recall* mode results of the last 10 measurements can be displayed.

Measurement results are saved in on-board memory in sets depending on the parameters set for measuring, for instance, if only distance is measured - the set will consist of one number, if distance and azimuth are measured – the set will consist of two numbers.

To enter the *Data Recall* mode press the M button in the *Ready to Measure* mode until **rEc** is displayed and then press the A button. First measurement set number (display name: **rEc** 1) will start flashing.

Pressing the M button moves the unit along the list of measurement set numbers and measurement results:

rEc 1, distance 1, azimuth 1, elevation 1,

rEc 2, distance 2, azimuth 2, elevation 1, …,

rEc 0, distance 0, azimuth 0, elevation 0.

Measurement sets are numbered in reverse order: first recalled set is the result of the last measurement. If any parameter has not been actually measured it will not be recalled.

Pressing the A button at any moment within the list of recalled results (or pressing the M button at the end of the list) brings the unit to the *Ready to Measure* mode.

Choosing **cLr** in the *Setup* mode will erase all measurement data.

Display test mode

Selecting Code 16 in the *Setup* mode will cause all display
segments and indicators to flash for 8 seconds.

Additional display information

Additional indication is displayed in the *Ready to Measure*
mode:

Y or **M**	Indicates that distance is measured and displayed in yards or meters
KMH or **MPH**	Indicates that speed is measured and displayed in km/h or mph
°	Indicates that only azimuth is measured
$\overset{\circ}{M}$	Indicates height in meters or azimuth is mils measured

OVER 100M – indicates that gating is active

Laser active indicator (6, Fig.2) flashes, when unit emits laser
radiation. Reliability of ranging depends on the number of pulses
that reflect from the target and reach the unit. Module informs
user about the number of received pulses by a message on LCD:

TARGET REFLECTION LOW – ranging results have low
    statistical reliability,

TARGET REFLECTION MED – ranging results have
    medium statistical reliability,

TARGET REFLECTION HIGH – ranging results have high
    statistical reliability.

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6. BEST MEASURING TECHNIQUE

Laser range finder module measures distance by catching a laser beam reflected from the target. Everything that improves reflection increases the measurement reliability and maximum range.

1. Aim at a surface on the target that is closest to the perpendicular to the laser beam. The closer you get – the stronger will be the reflection.

2. The unit deploys sophisticated software that tries to understand which target you are aiming at. However, due to beam divergence several objects may produce a strong reflection. To help the system recognise the target the *Target Selection Logic* may be used. For example, if ranging a wire in front of a building, selecting the "first" target (Code 12) will produce a more reliable result. Alternatively, when aiming at a chimney behind the trees, selecting "last" target (Code 11) will be better. By default the System assumes "auto" target selection, that is, the object producing the most reflections will be considered a target.

3. Another way to improve reliability of measurement is to use the gating mechanism. When gating is active reflections from all objects closer than the gating distance will be ignored. This is especially effective when ranging in unfavourable atmospheric conditions, that is, in the rain, fog, haze or bright sun. Gating provides better results than the "last" target selection, but it requires preliminary rough

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distance estimation to cut off all objects closer than the chosen one.

Note: the *Gating* setting is remembered by the System until altered. Therefore, if you forget to turn the gating off, the next time you start measuring it can ignore the desired object, if it is closer than the gating distance. The unit will display four dashes instead of the measurement results. "Over 100 meters" display indicator shows active gating.

7. Interconnectivity

The unit supports RS-232 interface. Physical connection is performed through a connector specific to each order. The default connectors are described in Specifications.

Connecting to computer

The communication port must be initiated prior to connecting the unit.

Data is transmitted as a hex string code with fixed baud rate of 9600 bit/sec, 8 bits, one stop bit, and no parity.

If the port is connected and not initiated, the module will be activated immediately in scan mode.

Data output protocol

This physical interface uses one line to an external UART (Universal Asynchronous Receiver / Transmitter) port. The data is transferred in accordance with the serial asynchronous communications protocol, known as the RS-232.

A typical UART frame is shown below. It comprises a Start bit, 8 data bits, and a Stop bit.

Along with the data transfer line the RS-232 port includes signal lines, used to control the module.

UART Frame

Start	D0	D1	D2	D3	D4	D5	D6	D7	Stop	Start	D0	D1
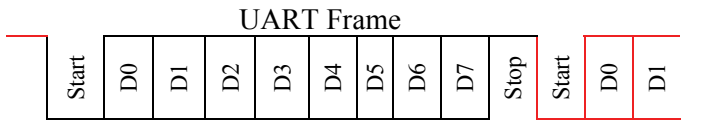
The data string has the following structure (in Hex):

b1 b2 b3 E4h b5 E4h 0Dh 0Ah,

where:

    b1 – type of measurement;

    b2 – sign of measurement (1 – minus, 2 – plus);

    b3 – LSB of result;

    b5 – MSB of result

Result of measurement = MSB * 256 + LSB

In both standard modes, when three parameters are measured, the module will generate three data sequences in one block, where the first one presents results of distance measurement, the second – results of azimuth measurement, the third – result of inclination measurement.

The data string will look like:

b1	b2	b3	E4h	b5	E4h		
b7	b8	b9	E4h	b11	E4h		
b13	b14	b15	E4h	b17	E4h	0Dh	0Ah

Where bytes contain the following information:

    b1, b7, b13 – type of measurement

    b2, b8, b14 – sign of measurement (1 – minus, 2 – plus)

    b3 – LSB of the result for the first type of measurement

    b5 – MSB of the result for the first type of measurement

    b9 – LSB of the result for the second type of measurement

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b11 – MSB of the result for the second type of measurement

b15 – LSB of the result for the third type of measurement

b17 – MSB of the result for the third type of measurement

Marker E4h is used to separate numbers, 0Dh 0Ah – to separate data sets.

Type of measurement (bytes b1, b7, b13) can have the following value:

1 – Distance in meters

2 – Distance in yards

3 – Azimuth in degrees

4 – Azimuth in mils

5 – Elevation in degrees

6 – Elevation in mils

7 – Elevation in meters

8 – Speed in km/h

9 – Speed in MPH

Additional communication features, for special orders only

Module sends its menu status to the interface every time the "Mode" button is pressed.

The mode state string has the following structure (in Hex):

S1 S2 S3 S4 0Dh 0Ah,

where

S1 – first symbol of the status menu

S2 – second symbol of the status menu

S3 – third symbol of the status menu or 21h

S4 – 21h or 00h

Examples of the LRF menu output:

Output, Hex	Output, ASCII	LRF menu position
53h 54h 31h 21h 0Ah 0Dh	ST1! \<LF>\<CR>	Standard 1
43h 4Fh 44h 21h 0Ah 0Dh	COD! \<LF>\<CR>	Code
47h 41h 54h 21h 0Ah 0Dh	GAT! \<LF>\<CR>	Gating
52h 45h 43h 21h 0Ah 0Dh	REC! \<LF>\<CR>	Recall
43h 4Ch 52h 21h 0Ah 0Dh	CLR! \<LF>\<CR>	Clear
52h 44h 59h 21h 0Ah 0Dh	RDY! \<LF>\<CR>	Position Ready
43h 31h 21h 00h 0Ah 0Dh	C1! \<NUL>\<LF>\<CR>	Code 1
47h 31h 21h 00h 0Ah 0Dh	G1! \<NUL>\<LF>\<CR>	Gating over 100 m

Output, Hex	Output, ASCII	LRF menu position
43h 31h 32h 21h 0Ah 0Dh	C12! \<LF>\<CR>	Code 12
47h 32h 34h 21h 0Ah 0Dh	G24! \<LF>\<CR>	Gating over 2400 m

Output connector pin layout and cable diagram

By default for the output connector the module uses the connector as described in Specifications. This connector withstands high environmental loads and is designed for outdoor usage.

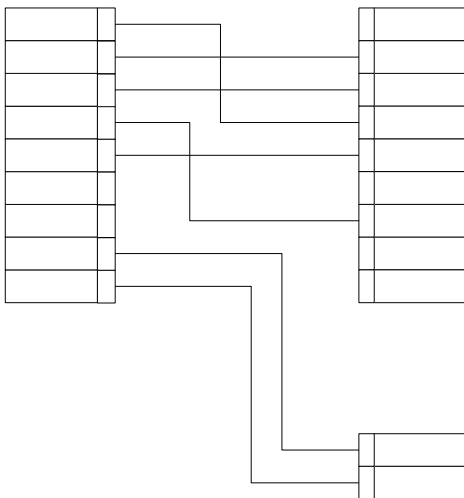**Figure 4. Cable diagram**

Connector and cable layout can be modified for specific customer needs.

GPS interconnectivity

The Modules can transmit the acquired data to a GPS receiver using the same output connector and the PLGR/DAGR protocol.

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Another cable is required and can be supplied as an option.

To work with GPS, perform the following steps:

- Switch to **PLGr** mode;
- Choose either **Std1** or **Std2** measuring mode;
- Connect the unit to and the GPS unit with the cable.

For each measurement the GPS unit will display the absolute coordinates of your target.

Note: If the module is not set initially to the Std1or Std2 modes, GPS connection will not operate properly.

Note: The GPS unit automatically adjusts coordinates to reflect actual magnetic declination. Therefore, coordinates displayed on the GPS may differ from those calculated by the computer.

8. STORAGE AND MAINTENANCE

The unit is a sophisticated precision optical instrument equipped with laser and electronics. Therefore, it should be handled with due care.

- Keep away from direct sunlight.

- Avoid impacts, jolts, dust, moisture, and sharp changes of temperature.

- Do not use the device at temperatures higher than 50°C (122°F).

- Do not touch optical surfaces by hands. Doing so may damage the anti-reflection coating.

- Clean optical surfaces only with professional camera lens cleaning supplies.

- Clean the exterior of the unit with a soft clean cloth.

- Keep away from heating appliances and central heating.

- All repair works must be performed by an authorized service.

- Avoid access of direct sun light into eye-piece optics for more then 5 sec consistently.

9. TROUBLESHOOTING

Ranging does not work. Display is transparent.

Check the power supply.

Ranging does not work. Display indicates results of the last measurement.

Wait for 8 seconds until the display becomes transparent, and press the Action button again.

Black dots are visible on LCD.

Liquid Crystal Display may have small black dots, scratches and other blemishes inherited from the manufacturing process. These flaws are strictly regulated by number, area and location and they do not degrade the product's measurement capabilities.

Range measurement cannot be obtained.

- Make sure that neither your hand nor finger is blocking laser emitting lens or receiver lens.

- Hold the unit firmly (avoid hand tremor) while pressing the Action button.

- Check that the target is within measuring range of the device and the gating mode does not cut it off.

10.   WARRANTY

NEWCON warrants this product against defects in material and workmanship for one year from the date of the original purchase, but no more than 18 months from the date of manufacturing. Longer warranty is available, subject to the terms of the specific sales contract. Should your Newcon product prove to be defective during this period, please deliver the product securely packaged in its original container or an equivalent, along with the proof of the original purchase date to your Newcon Dealer.

Newcon will repair (or at its option replace with the same or comparable model), the product or part thereof, which, on inspection by Newcon, is found to be defective in materials or workmanship**.**

*What This **Warranty Does Not Cover**:*

NEWCON is not responsible for warranty service should the product fail as a result of improper maintenance, misuse, abuse, improper installation, neglect, damage caused by disasters such as fire, flooding, lightning, improper power supply, or service other than by a NEWCON Authorized Service.

Postage, insurance, and shipping costs incurred while presenting your NEWCON product for warranty service are your responsibility.

If shipping from North America please include a cheque or money order payable to NEWCON OPTIK for the amount of US$35.00 to cover handling and return shipping.

11. CUSTOMER SUPPORT

Should you experience any difficulties with your NEWCON OPTIK product, consult the enclosed manual. If the problem remains unresolved, contact our customer support department at (416) 663-6963 or toll free at 1-877-368-6666. Our operating hours are 9am-5pm, Monday - Friday, Eastern Standard Time. At no time should equipment be sent back to Newcon without following the instructions of our technical support department.

NEWCON OPTIK accepts no responsibility for unauthorized returns.

To locate NEWCON Authorized Dealer call:

Tel: (416) 663-6963 Fax: (416) 663-9065

Email: newconsales@newcon-optik.com

Web: www.newcon-optik.com

The defective products should be shipped to:

US customers:

  2331 Superior Ave. Cleveland, OH 44114

all other countries:

  105 Sparks Ave., Toronto, ON

  M2H 2S5, CANADA

12. QUALITY CERTIFICATE

MOD 4EC	

The unit has passed the quality inspection.

Production date

Serial number

Quality Inspector

Purchase date

NEWCON OPTIK™ 2010

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