



## HOW TO GUIDE: High Accuracy NMEA Output

This document describes how to setup and use the high accuracy NMEA output functionality on the mojoRTK console. Its intended audience is a Leica-approved Value Added Reseller.

### Description

The mojoRTK console is capable of outputting position information in NMEA format. By default the position information has a reduced accuracy.

Two unlock codes are available which extend the NMEA output, mojoNMEA and Accurate Height:

- mojoNMEA enables output of accurate heading information and the selection of the position reference. The position reference can be:
  - The red antenna (default/none)
  - The middle of the tractor's roof (basic)
  - At ground level in the middle of the tractor with compensation for terrain (full)
- Accurate Height removes noise added to the height information

### Benefits

Enabling the mojoRTK console to output NMEA allows supporting devices to use the position information from the console. The mojoNMEA and Accurate Height unlock codes improve the position information in the NMEA output to the same accuracy level as is used by the console for guidance.

### Limitations

- The console only provides support for NMEA 0183 standard
- The console does not support flow control
- The console supports different baud rates but the baud rate selected may limit how many sentences can be output and the rate at which they are output. For example, at low baud rates it is not possible to output all sentences at 10 Hz. The mojoRTK console will detect this situation, display an error, and disable NMEA output. If you receive this error then switch to a higher baud rate or reduce the number and/or rate of sentences to be output.



## Required Items

- NMEA Cable (part number 675559)
- If high position accuracy is required then the following unlock codes will be needed:
  - mojoNMEA part number **9200009AG** and/or
  - Accurate Height part number **9200008AG**

## Configuration

Please refer to the How To Guide for installing unlock codes if mojoNMEA and/or Accurate Height are required.

**Note:** If the Accurate Height unlock code is installed then it will be enabled until the code expires. There is no option to turn off Accurate Height.

### Configuring NMEA Output

1. Switch on the mojoRTK console and from the Navigation screen press OK to enter the main menu
2. Navigate to the 'NMEA Settings' menu as follows:  
Settings -> Extended Features -> NMEA settings
3. To turn NMEA output on select 'Output Enabled' and press the OK button
4. To change the RS232 baud rate select 'Baud Rate' and press OK. Use the main dial to scroll through the list of baud rates. Press OK to select a rate or Escape to cancel
5. To change the output rate of a sentence select the desired sentence from the menu and press OK. Use the main dial to select either 'Off', 1 Hz, 5 Hz or 10 Hz. Press OK to select a rate or Escape to cancel. Note that not all sentences support output rates greater than 1Hz.

### Configuring correction type (requires mojoNMEA)

1. Switch on the mojoRTK console and from the Navigation screen press OK to enter the main menu
2. Navigate to the NMEA Settings menu as follows:  
Settings -> Extended Features -> NMEA settings
3. Select 'Position Correction' and press OK
4. Use the main dial to select the desired correction type. Press OK to confirm or Escape to cancel

## Compatibility

The NMEA output has been successfully used with many manufactures including:

- Accutrak
- AgLeader
- CNH Case New Holland
- Farmscan
- Intellislope
- John Deere
- Raven
- Rinex
- Teejet

### Compatibility Mode

Some devices require the use of compatibility mode for correct operation. When operating in the standard mode the fix quality flag indicates the type of GPS position that is being reported. In this mode fix qualities could be no GPS, GPS, DGPS or RTK. In compatibility mode the fix quality reported will either be no GPS or GPS.

To enable compatibility mode:

1. Switch on the mojoRTK console and from the Navigation screen press OK to enter the main menu
2. Navigate to the 'NMEA Settings' menu as follows:  
Settings -> Extended Features -> NMEA settings
3. Select 'Compatibility Mode' and press the OK button to toggle compatibility mode

## Logging NMEA Data to a USB Drive

The NMEA output can be logged to a USB drive for post processing of the data. This can be useful for mapping where a vehicle has been or determining the slope of a field.

To enable logging of NMEA data:

1. Switch on the mojoRTK console and from the Navigation screen press OK to enter the main menu
2. Navigate to the 'NMEA Settings' menu as follows:  
Settings -> Extended Features -> NMEA settings
3. Select 'Log NMEA to USB' and press the OK button to toggle the logging functionality.

Once NMEA logging has been turned on the NMEA sentences are logged to the USB stick as they appear out the serial port. The NMEA data is logged to a file named 'nmea\_log.txt' in the root directory of the USB drive.

## Background Information

The mojoRTK console is capable of outputting the following NMEA sentences:

- GPGBA – geographic coordinates
- GPGLL – latitude and longitude
- GPRMC – coordinates and direction
- GPZDA – date and time (Zulu Date)
- GPGSA – GPS satellites available
- GPGSV – GPS satellites in view
- GPVTG – velocity and direction
- GPGST – noise statistics (position errors)

## Glossary

Console The Leica mojoRTK console

NMEA National Marine Electronics Association

NMEA 0183 NMEA 0183 is a combined electrical and data specification for communication between marine electronic devices such as echo sounder, sonars, anemometer (wind speed and direction), gyrocompass, autopilot, GPS receivers and many other types of instruments