

**OPERATION MANUAL  
FOR  
NRT202  
DATA TERMINAL**

**NOMAD™ - NRT202  
OPERATING INSTRUCTIONS**

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## **1. IMPORTANT INFORMATION**

**FCC ID: OOANRT202**

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Warning!** Any modification or changes made to this device, unless explicitly approved by Maynetronics Limited, will invalidate the authorisation of this device. Operation of an unauthorised device is prohibited under Section 302 of the Communications Act of 1934, as amended, and Subpart I of Part 2 of Chapter 47 of the code of Federal Regulations.

## **2. INTRODUCTION**

The NRT202 data terminal is a hand-held wireless keypad and display for entry of numeric data. This terminal provides the primary data entry method of the NOMAD system.

Data entry is guided by menus displayed on the graphic display.

The terminal is powered by rechargeable batteries with a built in charger that draws DC power from a charging adapter. In an emergency, the rechargeable battery may be replaced by standard alkaline batteries providing no attempt is made to charge the unit while fitted with the non-rechargeable battery.

The terminal does not have to be in radio range for data entry to take place. All data entered is stored in the terminals own memory (the memory is maintained even if the battery is discharged) and then sent to the NOMAD system whenever there is a good communication link. To the operator this is a seamless process. This is a key strength of the NOMAD system - essential operation is guaranteed regardless of sporadic radio interference.

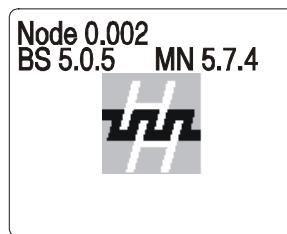
## **3. SETTING UP A TERMINAL FOR FIRST USE**

Before a terminal can be used on the NOMAD network it must be assigned a node number so that the system can distinguish it from other terminals in the system. This will also clear the memory of the terminal and inform the system that all relevant menus should be uploaded into the terminal.

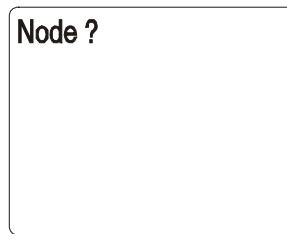
### **3.1 ENTERING A NODE NUMBER**

Every terminal on a given system must be uniquely identified by a node number. Entering a node number on a terminal also initialises it for use on the system by clearing the terminals memory and requesting a full update from the system of all menus.

After inserting the batteries or removing the terminal from its charging station a startup message is displayed.



To set the node number, press the 3 and the 9 keys simultaneously while this message is displayed. The prompt "Node ?" will be shown.



The node number is entered as 5 decimal digits: xyzzz

zzz = the node number.  
y = the language.  
x = the system number.

The node number itself can be in the range 1 to 231. It is these three digits that identify the terminal on the system.

The language number can be in the range 0 to 3 and indicates which language the menus should be. The default system language is 0. Additional languages (up to three) can be defined in the system setup for NOMAD and individual nodes then initialised to one of these. This way employees of different languages may work on the system side by side. Note that to change language the terminal has to re-initialised and its memory cleared as above. If a language number is entered that hasn't been defined in the NOMAD system then the default language is used.

The system number can be in the range 0 to 3. The default system number is 0. Different system numbers can be entered in the Radionet application and a terminal will only communicate with a system on its own number. This allows adjacent systems to work independently.

After entering the node number as above press the 'ENT' key. The terminal will then initialise its memory after which the startup message will be displayed again.

## **3.2 CHANGING OPERATING MODES**

The terminal can be set to be used by an individual or by a group. The normal mode after initialisation is for individual use.

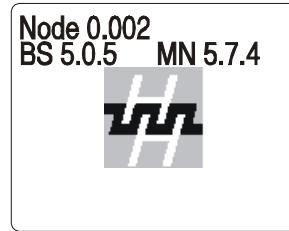
Multi-user mode is intended for the situation where a supervisor is entering in data for several employees. It allows the operator number and time to be set for each data entry.

The mode is changed in a similar fashion to setting the node above. During the startup screen press the '4' and the 'CLR' keys simultaneously. Each time this is performed the mode will toggle between normal and multi-user.

## **4. THE LCD SCREEN**

### **4.1 STARTUP MESSAGE**

The start-up message indicates the firmware versions for the terminal along with the system and node numbers.

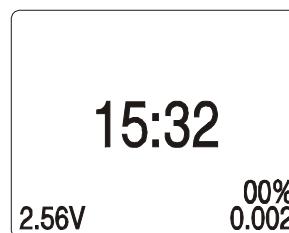


In the example above the firmware bootstrap is version 5.0.5, the main code version is 5.7.4, the system number is 0 and the node number is 002.

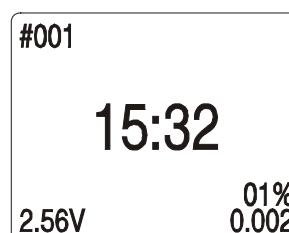
The start-up screen shows for 5 seconds and is shown whenever the terminal is removed from the charging station or the batteries are inserted.

## **4.2 STANDBY MODE**

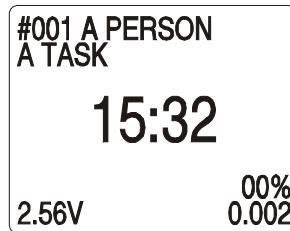
The default display for the terminal takes the general form below,



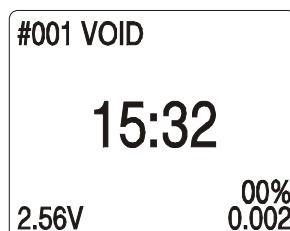
A typical display after removing a terminal from the charging station. It shows the time, the node number and the percentage of memory used. It also shows the operator number and name of the person registered to the terminal along with the currently selected task for barcode use.



This shows that operator 1 has clocked on. There is one message (01%) waiting to be sent to the system (the clock on message).



The message has been sent (00%) and confirmation that operator 1 is recognised in the system is shown by displaying their name. If operator 1 had not been recognised then the following would be displayed.



If the battery starts to get low the “Batt” symbol will alternate with the battery voltage in the lower left corner. When the battery has insufficient power to operate the terminal reliably the “Batt” symbol will be displayed continuously.

## **4.3 PAGING FACILITY**

There is a facility within the NOMAD system to send short text messages to specific terminals. When such a message is received and the terminal is in standby mode it will give a series of beeps and the standard display will be replaced by the text message, which will flash on and off.

To cancel the message and return to normal standby mode press and hold the 4 and 6 keys as if about to enter data. This will cancel the page message. Press the ‘CLR’ key to return to standby mode.

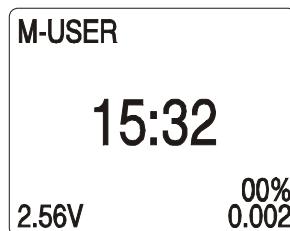
## **4.4 FEEDBACK**

If operator feedback is enabled on the NOMAD system a message is sent to the operator after each task code (for which feedback has been defined) has been received by the system. When the terminal receives the message a double beep will be emitted.

To view the feedback message press and hold the up arrow key while in standby mode. Releasing the up arrow key will return the terminal to standby mode.

## **4.5      MULTI-USER**

If in multi-user mode the operator number/name will be replaced by “M-USER”



## **5.      ENTERING DATA**

The normal state of the terminal is standby - the keypad is locked against accidental operation.

### **5.1      NORMAL MODE**

To exit the standby mode press and hold the 4 and the 6 keys together. A prompt inviting the user to “Enter Command” will be displayed.

*Note that all or some of the prompts may have been redefined in the NOMAD system depending on the language settings.*

Key in the number of the task to be entered. As the digits are keyed in a menu prompt will be displayed if the task code is one that has been defined.

Alternatively, if the task code is not known press and hold up or down arrow keys to scroll up and down through the available task codes.

Press the ‘ENT’ key when the desired task code is displayed. Further prompts may be displayed requesting the user to in turn enter any additional parameters required by the task code. For example, after pressing ‘ENT’ for “Clock In” the user is prompted for “Operator” and should enter their works number.

The number of digits that the terminal will accept will vary depending on the parameter and the setting made in the NOMAD system.

Note that the terminal will only accept codes other than “Clock In” (code 0) if the user has clocked in. Once clocked in the prompt for code 0 will change to “Clock Out”. After pressing enter to “Clock Out” the user will be prompted to “Confirm”. This is done by pressing the ‘ENT’ key again.

## **5.2      MULTI-USER MODE**

To exit the standby mode press and hold the 4 and the 6 keys together. A prompt inviting the user to “Enter Operator” will be displayed.

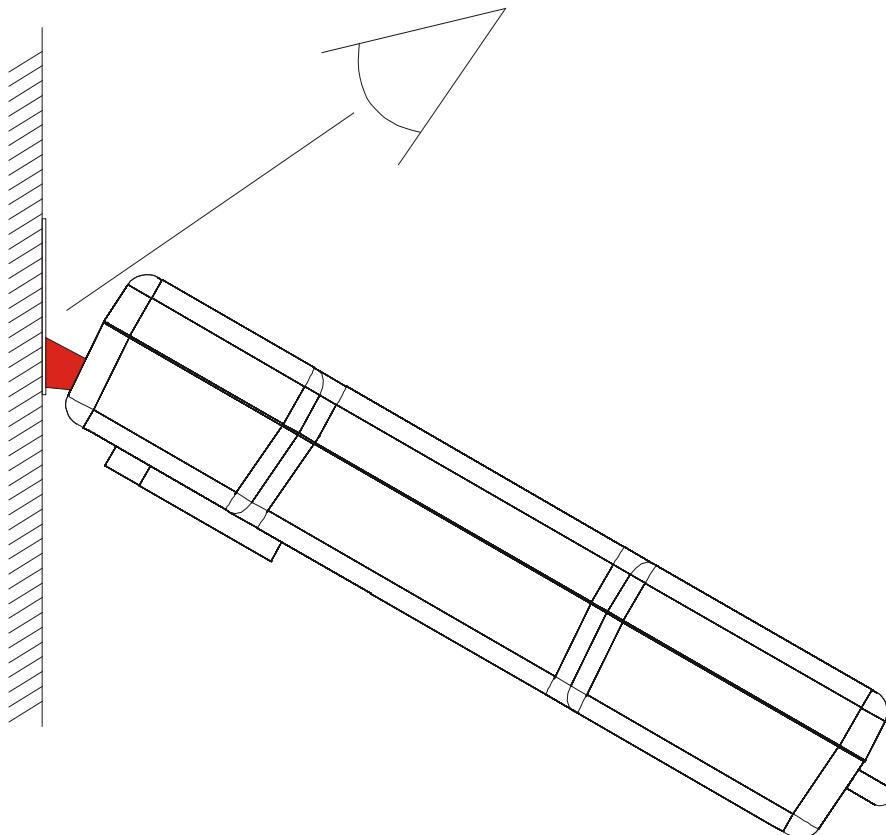
Enter the operator number for the task to be entered and press ‘ENT’. A prompt inviting the user to “Enter Time” will be displayed.

The current time will be display in the lower right corner of the screen. To accept this press the ‘ENT’ key, else key in the required time and press the ‘ENT’ key.

The rest of the process is as per section 5.1 above.

## **6.      BARCODE ENTRIES**

All entries can also be made with the built in barcode scanner. Pressing the down arrow key will activate the barcode scanner for 5 seconds or until a valid barcode is found. The terminal should be placed in contact with the object to which the barcode is fixed so that it can be seen that the red illumination covers the barcode.



## **6.1      WARNING TONES**

There are three possible results of scanning a barcode and each produce a different type of beep from the terminal.

- The barcode is read and accepted – single beep
- The barcode is read correctly but rejected (for example, an attempt to enter a task before being clocked in) – three distinct beeps.
- The terminal was unable to read the barcode – long waning tone with two distinct pitches.

Should the warning tone be heard, the operator should check the scan window for obstruction and then scan again, taking care to ensure that the terminal is aimed correctly.

## **6.2      BARCODE TYPES**

The standard terminal will only recognise barcodes printed by the NOMAD system on an approved printer

The NOMAD system has distinct categories of barcodes so that the terminal can recognise whether the difference between clocking in operator one or entering task one. There are two types of task barcode. One is for entering the task there and then, for instance coffee break. The other is for selecting a task that will require further information (such as a row or path number to indicate the operator's location) that will be entered later.

Categories are

- Clock in
- Clock out
- Enter task
- Select task
- Row/Path
- General

## **6.3 MAKING AN ENTRY**

A typical sequence for operator 1 and task number 3, interrupted by task 100 might be as follows.

1. Scan "clock in 001" label (in the canteen/entrance area)
2. Scan "select task 003" label (in the canteen/entrance area)
3. Scan "row" label (in the glasshouse)
4. Scan "row" label (in the glasshouse)
5. Scan "enter task 100" (in the canteen/entrance area)
6. Scan "row" label (in the glasshouse)

In the above sequence, the first scan (clock in) results in an entry in the terminal. The second scan (select task) does not produce an entry in the terminal. The third and fourth scans produce entries for task 3 with the row number scanned. The fifth scan (enter task) produces an entry in the terminal.

The meaning of the task numbers depends on how the system has been set up, task 3 might be to de-leaf a row of fruit and task 100 might be a coffee break.

Note that the selected task remains selected in the terminal even when a directly entered task (such as coffee) is scanned. In this way the operator can continue with their selected task by scanning the next row number.

## **6.4 KEYPAD ENTRIES**

It is also possible to use a combination of keypad entries and barcode entries. It might be desirable for the operator to use keypad entries for clocking in/out and selecting tasks and only using the barcode labels for the rows for instance.

Conversely, some customers might not appreciate the benefits of labelling every row within a glasshouse yet want greater security over clocking in and task selection. With this in mind a barcode only mode is available.

## **6.5 BARCODE ONLY MODE**

In barcode only mode, it is still possible to enter a row via the keypad but all other entries, including task selection, must be made via the keypad. Barcode only mode is indicated on the screen via “BC” in the top right corner.

To activate/deactivate the barcode only mode the ‘0’ and ‘2’ keys should be held down while the start-up screen is shown (see section 2).

## **6.6 SUN SHIELD**

For scanning in high ambient light environments, such as the glasshouse, the barcode labels should be fitted in the optional sun shields. It is also recommended that the sun shields should be used wherever possible as they also act as a guide to correctly position the terminal which minimises time lost to operators not correctly aiming their terminal.

# **7. ERROR MESSAGES**

## **7.1 CLOCK NOT SET**

If the internal clock has not acquired the current time from the NOMAD system then an error message will be displayed “CLOCK NOT SET”. If this message is displayed ensure that the terminal is within range of a link unit to allow the terminal to acquire the time. Once the time is acquired the internal clock of the terminal will maintain the time until power is lost.

## **7.2 FLAT BATTERY**

If the rechargeable battery is at a level where safe data entry cannot be guaranteed the terminal will prevent the operator from entering data and a "Flat Battery" message will be displayed whenever data entry is attempted.

The terminal should be placed back in its charger and the battery allowed to charge. Alternatively, the battery could be replaced with a spare fully charged battery.

**DATA WILL NOT BE LOST IF THE BATTERY FULLY DISCHARGES.**

### **7.3      MEMORY FULL**

If the memory has insufficient space to make another entry the "Memory Full" message will be displayed. If this happens ensure that the terminal is in communication range of a link unit to allow the system to extract the data and therefore free up memory. While this is happening the % meter in the lower right corner of the display will be seen to decrement as each message is sent.

## **8.      CHARGING**

There is no on/off switch on the terminal. It is intended that it is either in use or on charge. No harm will be done to the battery if the terminal is left on charge for indefinite periods.

To charge the terminal place it in the charging station so that it is sitting with the display showing and ensure that the terminal is slid all the way down in the charging station. After a second has elapsed the terminal will beep and the message "CHG1" or "CHG3" will be displayed. These messages indicate that the terminal is charging.

The charging cycle and the meaning of the "CHG" messages is as follows.

CHG1	The battery is very discharged and is being slow charged. When sufficient charge has been put into the battery it will switch to fast charge.
CHG3	The battery is being fast charged. When the battery is fully charged it will switch to trickle charge.
CHG4	The battery is fully charged and is now being trickle charged to maintain its charge.

A fully discharged battery will take around 7 hours to recharge.

## **9. MAINTAINENCE AND CARE**

The NRT202 terminal has been designed to give reliable service in the intended environment and is largely maintenance free.

### **9.1 CLEANING**

Periodically wipe the barcode window and front face of the terminal with a damp cloth to remove dirt. If necessary a water based cleaner may be used to remove stubborn deposits.

**DO NOT USE SOLVENT CLEANERS.**

### **9.2 BATTERIES**

With normal use the expected life time of the supplied batteries is 500 charge/discharge cycles, after which they should be replaced. For optimum performance it is recommended that the batteries be replace annually.

### **9.3 KEYPAD**

On no account should the keys of the terminal be pressed with sharp or hard objects - including fingernails. Use of such objects may result in premature failure of the keypad.

## **10. SPECIFICATION**

Power	2x 1.2V 700mAh NiMH AAA.
Average Consumption	25mA
Charging Input	9-15V DC @ 55mA max
Radio link frequency	915MHz
Barcode symbology	Code 39
Environmental protection	IP64

## **10.1 COMMUNICATION RANGE**

Communication range is subject to local environmental conditions. The NRT202 terminals are designed to have a typical communication distance of 50m from a link unit in a glasshouse.

Communication range will be affected by local conditions and no guarantee can be made of the actual communication range encountered in an individual situation.

It should be noted that during periods of communication blackout the terminal will continue to function normally (with the exception of feedback and paging) and any entered data will be automatically transferred when communication is re-established.