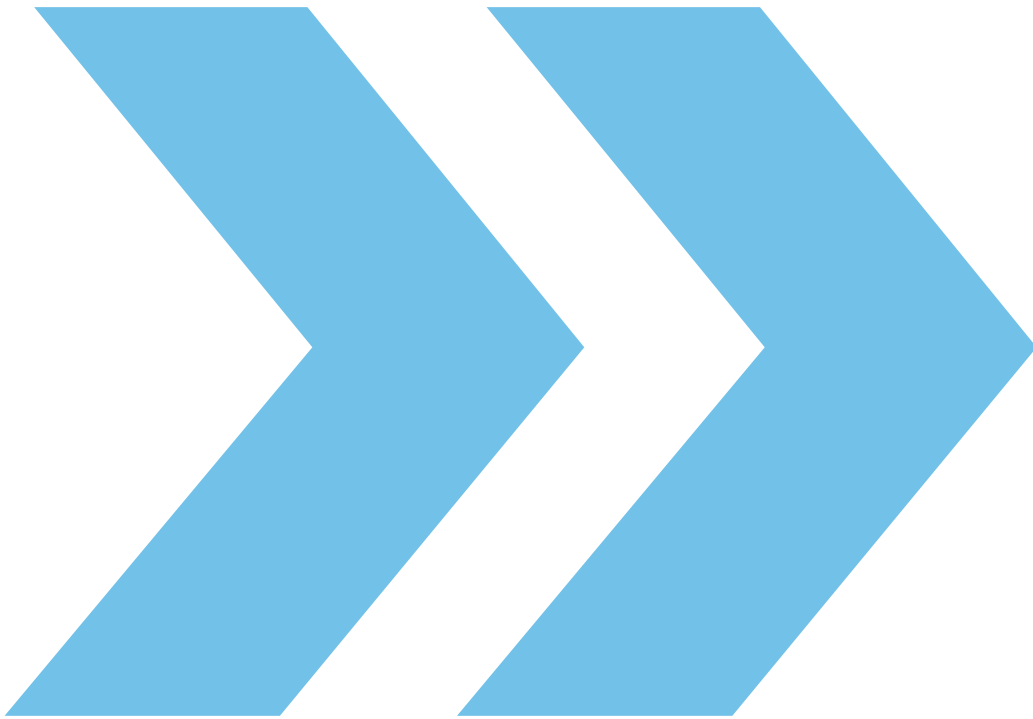




TX5003 RMXR Portable Reader
RockMonitor XR System



TROLEX | NOME

User Manual

TX5003 Portable Reader

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1. General Description

The Trolex | Nome TX5003 RockMonitor XR Portable Reader has been designed to be a handheld interrogation tool, used to provide diagnostic information during the installation and maintenance of a RockMonitor XR strata monitoring system.

When connected, the Portable Reader automatically detects networked TX5001 RockMonitor XR telltales and periodically polls connected instruments to collect and log measurement data and device information.

Built on the same platform as the TX5002 RockMonitor XR Controller, the Portable Reader is certified Intrinsically Safe with the control circuits housed in an IP65 rated Stainless Steel enclosure that is protected and stored using the leather carry case provided.



TX5003 RMXR Portable Reader

1.1 Main features

- Portable RockMonitor XR system commissioning and debugging unit
- Plug and play communication with RockMonitor XR system
- Built on TX5002 RockMonitor XR Controller platform
- Remotely apply power to a RockMonitor XR system, individual roadways or instruments
- Intrinsically Safe rechargeable NiMH battery with up to 12 hours use
- Choice of device functional modes, 'Commissioning' or 'Data logging' (Auto Wake) for extended battery life
- Remote data logging of commissioned instruments (Telldatales)
- Connect to USB serial port above ground to download data sets
- 3 x Robust, push lock connectors for device I/O's (Network, USB and Charging connection)
- Operational stability in varying environmental and atmospheric conditions
- On-device display readout
- On-device functional keypad
- High visibility L.E.D indicators
- Increased protection leather pouch for harsh environments

1.2 Intended Use

The TX5003 RockMonitor XR Portable Reader is designed for use in Group I hazardous environments in conjunction with the RockMonitor XR system. The instrument is suitable for monitoring the status of a full telltale network (up to 150 telltales), individual roadways comprising of several telltales or individual telltale instruments.

In the same way that the TX5002 RockMonitor XR Controller collects and logs system data, the portable reader can be used to log data sets over defined time periods. Returning to the surface, users can locally download collected data to a computer via USB serial port connection in conjunction with the RockMonitor XR Portable Reader application.

Beyond system interrogation and data collection, the instrument can be used to identify, and fault find system short circuits, voltage drops and anomalies to improve the ease of overall maintenance of a commissioned RockMonitor XR system.

Although the instrument offers data logging functionality for use during commissioning and install, Trolex recommends that a TX5002 RockMonitor XR Controller connected to a server is used for long term data collection.

1.3 Limits of Use

To ensure the optimum performance and safe operation, the RockMonitor XR Portable Reader must be operated as per the limits detailed in the technical data section of this user manual. Operation outside these limits may result in damage to the equipment or failure to achieve the performance specification.

Trolex will not be liable for any injury or damage caused by incorrect installation, setup, operation or maintenance resulting in a failure to follow the procedures and safety instructions provided in this user manual.

Continual operation of the instrument at extremes of the specified temperature limits may reduce the operating lifetime of the product.

2. Product Safety

The following symbols are used in this manual or on the instrument to indicate procedures that, if not followed correctly, may result in personal injury or damage to equipment.



WARNING!

Alerts the user to a procedure or practice which, if not followed correctly, can result in damage to the system or ancillary equipment.

3. Safety Procedures

Always observe the safety precautions detailed in this user manual. Personnel installing, operating or maintaining the equipment are responsible for their personal safety and correct handling of the equipment in accordance with all safety instructions detailed.

Follow all warnings and instructions marked on the instrument. Warning labels are situated on the instrument, indicating a hazard at or near the location of the warning label.

Retain these instructions in a safe and known place for future use.

The RockMonitor XR Portable Reader has been designed to be as simple to install and commission as possible. Nevertheless, installation in working environments can be challenging and correct set up is critical to the function of the instrument. It is important that you carefully read the entire User Manual before using the instrument for the first time and keep it in a safe place for future reference.

Refer to the following standards for additional guidance:

- IEC/EN 60079-14
- IEC/EN 60079-25

Refer to the Certification and Conformity section of this User Manual and to the relevant certificates for any installation parameters and special conditions of safe use.

Observe the national safety regulations issued, for example, by the employers' liability insurance association, social security institutions, occupational safety and health authorities or other safety organisations.



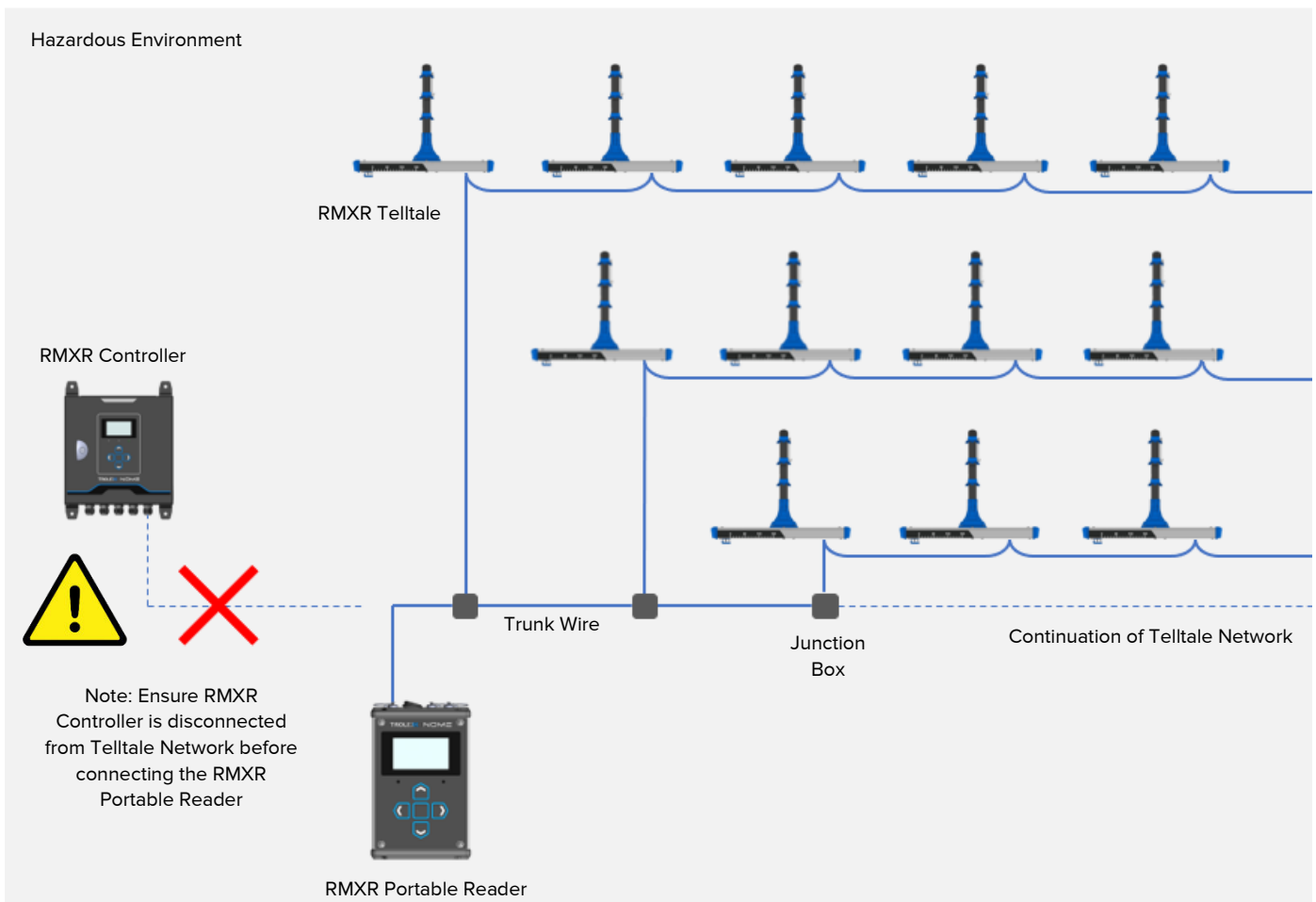
WARNING: There are no user serviceable parts inside the RockMonitor XR Portable Reader housing. Servicing should only be carried out by Trolex or a Trolex approved service technician.

4. System Components

The RockMonitor XR Portable Reader is typically used alongside an existing RockMonitor XR system install, during fault finding, remote data logging or system expansion, but can also be used during the commissioning of a new system where required.

Using the instrument 'network connection' port (Marked 'Telltale'), a connection can be established with up to 150 telltale instruments where required with detailed interrogation information being polled directly to the Portable Reader.

Note: Only one TX5002 RockMonitor XR Controller or TX5003 RockMonitor XR Reader is permitted to be connected to the telltale network at any one time. Before connecting the Portable Reader, ensure that the telltale network has been disconnected from the master TX5002 Controller.



Example installation configuration

Note: Installations and use cases may vary from diagram shown.

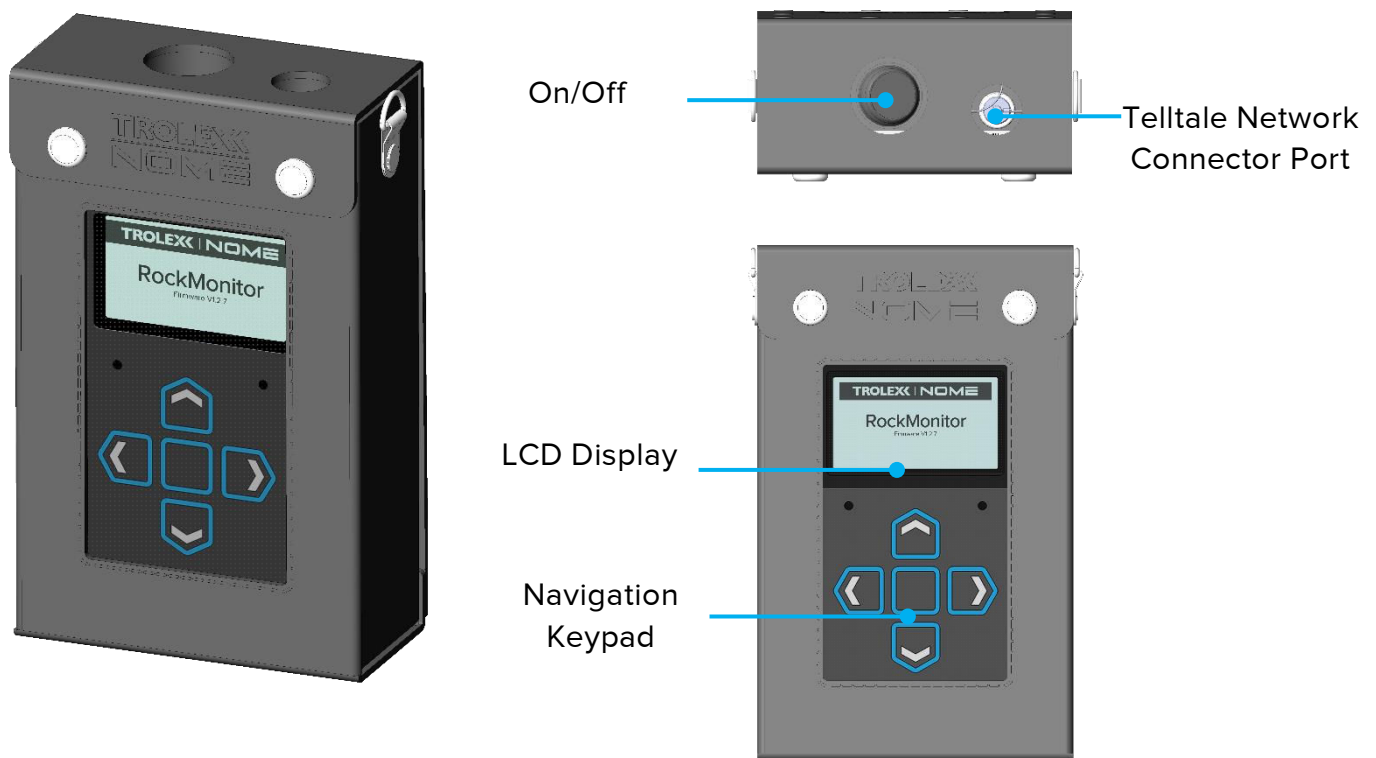
4.1 TX5003 RockMonitor XR Portable Reader

The Portable Reader is supplied housed within a custom leather carry case for use in hazardous environments and to provide increased instrument protection.



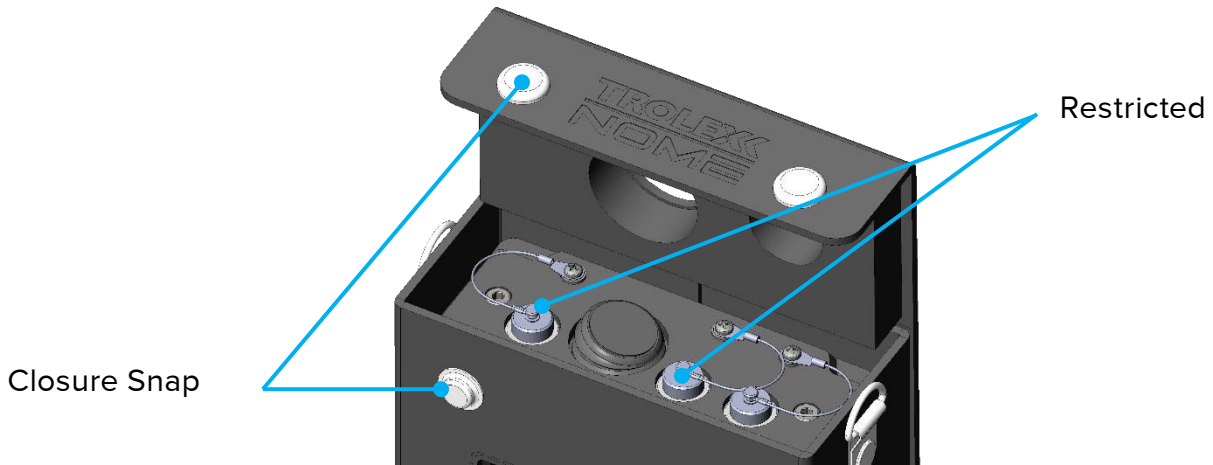
WARNING: The TX5003 RockMonitor XR Portable Reader must only be used underground or in a hazardous environment when in the leather carry case provided.

The figure below shows the instrument housed within the protective leather carry case. The On/Off switch and Telltale Network connection are always exposed through the top face of the leather pouch for continuous use. Both instrument charging and USB connectors have restricted access, only becoming available when the carry case top has been lifted in the designated safe area.

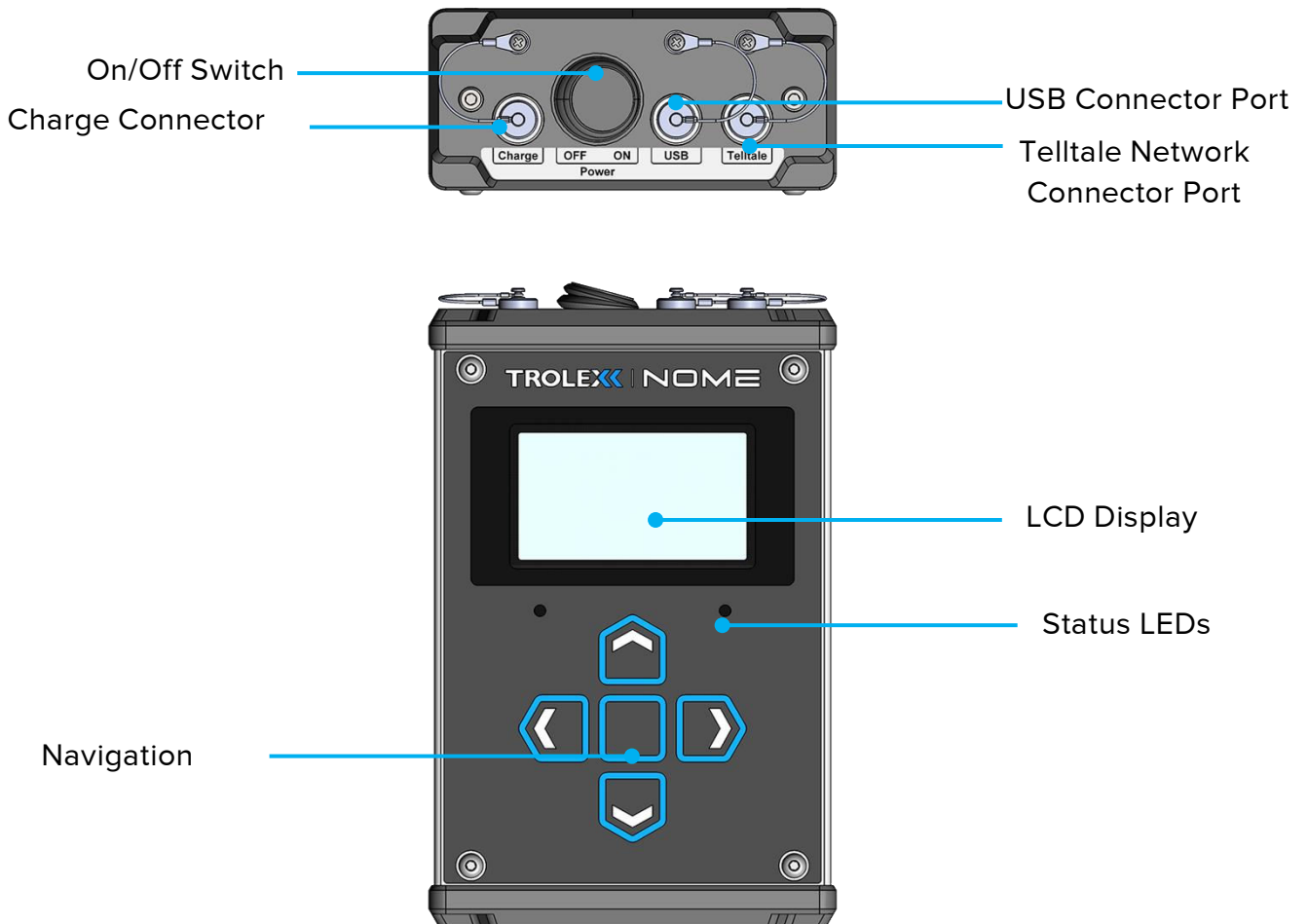


WARNING: Do not remove the instrument from the leather carry case provided when used underground or in a hazardous environment.

On lifting the leather carry case top, fastened and unfastened with the closure snap buttons, the remaining connections are exposed as per the figure below.



The figure below shows the instrument without the leather carry case and details the location of the I/O connections, navigation buttons, display screen and screen and status LEDs.

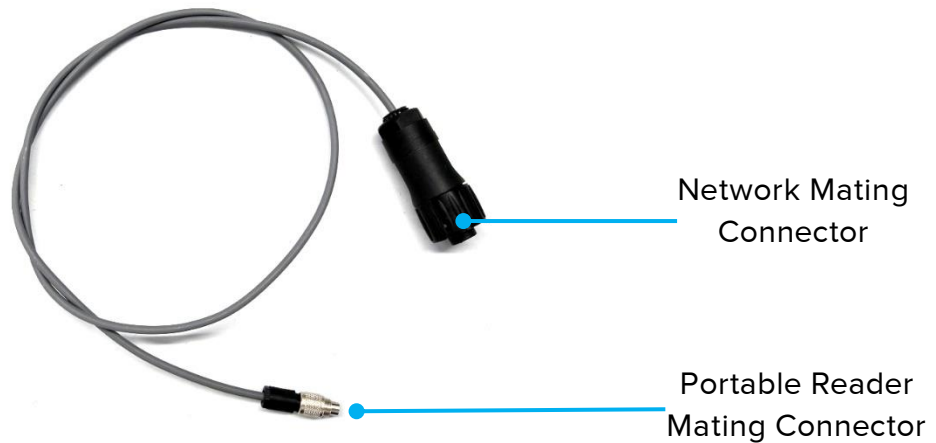


WARNING: The IP Rating of the RockMonitor XR Portable reader must be maintained by replacing the I/O connector caps attached after use.

4.2 Peripherals and Accessories

Telltale Network Connection Cable

The RockMonitor XR Portable Reader must only be connected to the RockMonitor XR Telltale system using the Network Connection Cable provided (1m fixed length). The network connection cable interfaces with the portable reader using a quick connect IP66/7 mating shell and at the System, Junction Box or Telltale interface uses a robust mating connector.



Serial to USB Cable (For use in the Safe Area only)

The RockMonitor XR Portable Reader must only be connected to a PC using the Network Connection Cable provided (1.8m fixed length). The USB patch cable interfaces with the portable reader using a quick connect IP66/7 mating shell and a USB type A at the computer communications port.



Instrument Battery Charger (For use in the Safe Area only)

The RockMonitor XR Portable Reader must only be connected to the battery charger provided (1m fixed length). The battery charger interfaces with the portable reader using a quick connect IP66/7 mating shell and comes with interchangeable wall plug adapters as standard.



5. Charging and Power Management

The RockMonitor XR Portable Reader is powered using an Intrinsically Safe certified Ni-MH rechargeable battery pack. Ensure that you are familiar with the procedures and information below to ensure maximum operating life of the instrument.


5.1 Before Use

On receiving the instrument, it is important to complete a charge cycle to ensure that the battery has a full working range. Due to the nature of Ni-MH cells, self-discharge rates can vary due to shipping and storage temperatures.

5.2 Battery Pack Labelling

The label below details the operating and safety parameters of the rechargeable Ni-MH battery pack and can be found on the back of the instrument, protected by the leather carry case.

RMXR PR Battery Pack
 12 V / 1000 mAh / 12 wh Ni-MH
 Do not disassemble, modify,
 puncture, mechanically shock,
 crush or short circuit the battery pack



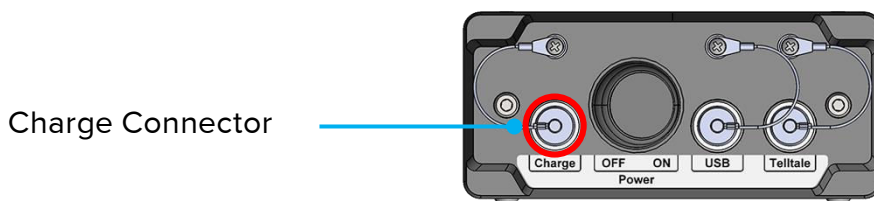
5.3 Charging Setup

It is important that the following procedures are followed when charging the RockMonitor XR Portable Reader.



WARNING: Do not charge the instrument when used underground or in a hazardous environment.

The Portable Reader charge socket is located on the top of the instrument, uncovered by lifting the leather carry case top. Only ever connect the instrument charger to the socket labelled 'Charge' highlighted below.



The wall charger unit houses the charge indication LED, which illuminates on use. During instrument charge cycles, the indicator will flash green and will settle on a solid green light when fully charged. If a charging fault is detected, the charge indicator will flash red.



WARNING: Ensure that the Portable Reader power switch is set in the 'Off' position before connecting to the charge unit.

To charge the RockMonitor XR Portable Reader:

Note: The instrument cannot Charge and Power at the same time.

1. Ensure that the wall charger has been configured with the appropriate regional adapter.
2. Plug in the wall charger and ensure power is applied.
3. Remove the leather carry case top, exposing the Portable Reader charge socket.
4. Remove the IP cap from the charge socket.
5. Ensure that the Portable Reader power switch is set in the 'OFF' position.
6. Mate and couple the wall charger connector with the Portable Reader charge socket.
7. The instrument will automatically begin the charge cycle, Note green flashing indicator.
8. When the charging indicator has settled on a solid green light, charging is complete.
9. Remove charging connector and replace IP protection cap.
10. Replace leather carry case top ready for instrument use.

After charging, the instrument is ready for operational use. A full charge cycle provides the capacity of up to 12 hours working life, which can vary depending on operational requirements. See Section 5.7 on which details the data logging operating life of the portable reader for more information.

5.4 Power Switch Positions

The Portable Reader Note the following operating positions of the instrument power switch when charging:

1. Ensure that the power switch is set to 'OFF' before charging the instrument.
2. Do not connect the instrument to the charger with the power switch in the 'ON' position.

If the instrument is connected to the charger and turned on, it will not complete a charge cycle and the battery will enter a discharge state.

Switch 'OFF' position = Instrument Charge; Switch 'ON' position = Instrument Discharge.

5.5 Charging Cycles

It is recommended that the instrument is always subject to appropriate charging cycles where possible to maintain the lifespan of the Ni-MH battery pack. The Portable Reader should not be left on charge for more than 12 hours to prevent loss of battery capacity over extended time periods.

5.6 Over-discharge

Complete discharge of Ni-MH cells can cause permanent damage to the instrument battery pack. It is recommended that the RockMonitor XR Portable Reader is never left switched 'ON' to prevent the instrument from draining the cells below safe discharge levels.

5.7 Power Consumption

The battery life of the RockMonitor XR Portable Reader will vary based on the following working parameters. It is important to consider the list below when using the instrument:

1. Number of telltales connected to the instrument (Baseload of 90mA + 0.8mA x n)
2. Data logging periods (data logging/min)
3. USB data download size (175 readings/min @ 90mA).
4. Display backlight brightness

Note: When set to data logging mode, the battery life of the RockMonitor XR Portable Reader will vary based on the defined system log interval periods. The table following can be used to indicate the instrument battery life and run time in hours, based on the data logging poll rate vs. number of Telltales connected.

During data logging intervals, the instrument will enter a battery saving sleep mode, before waking to take the next scheduled reading.

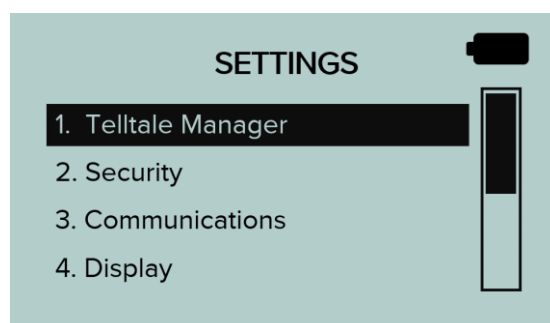
Data Log Poll Rate (Hrs)	Number of Connected Telltales (TT)									
	15-TT	30-TT	45-TT	60-TT	75-TT	90-TT	105-TT	120-TT	135-TT	150-TT
0.5	41	30	22	17	13	10	8	7	6	5
1.0	47	39	32	26	21	17	14	12	10	9
1.5	50	43	37	31	27	23	19	17	14	13
2.0	51	46	40	35	31	27	23	20	18	16
2.5	52	48	43	38	34	30	26	23	20	18
3.0	53	49	45	40	36	32	29	26	23	20
3.5	53	50	46	42	38	34	31	28	25	23
4.0	54	51	47	43	40	36	33	30	27	24

The Portable Reader can support the powering, interrogation and data logging of a maximum network size comprising of 150 telltale instruments. With large networks, data polling, logging and caching may be slower than the rate specified as the instrument will need to perform a wake up routine, entire system connection and poll (4s a Telltale), before taking/logging the system data set.

Note: it is recommended that for continuous data logging a TX5002 RockMonitor XR Controller is installed alongside a remote server.

5.8 Battery Life Indication

The instrument battery life indicator can be found in the top right corner of the display and is identified by a battery indication symbol. Battery life levels are defined by indication bars, noting full charge, half-life and low power. When the instrument battery is extremely low, the battery symbol will flash – Turn off the unit to prevent further discharge and recharge.



6. Certification and Conformity

	<p>IECEx (International) certification for use in underground mines in Australia (including Queensland) and New Zealand.</p>
	<p>Standards: IEC 60079-0:2017 Edition 7.0 IEC 60079-11:2011 Edition 6.0 IEC 60079-25:2010 Edition: 2.0</p>

	<p>ATEX certification for use in underground mines in European Union.</p> <p>Complies with the following EU Directives:</p> <p>ATEX Directive 2014/34/EU</p> <ul style="list-style-type: none"> - EN IEC 60079-0:2018 - EN 60079-11:2012 - EN 50503:2000 <p>EMC Directive 2014/30/EU</p> <ul style="list-style-type: none"> - EN 61326-1:2013 - EN 61000-6-2:2019 - EN 61000-6-3:2007+A1:2011 <p>RoHS Directive 2011/65/EU</p> <p>System</p> <ul style="list-style-type: none"> - EN 60079-25:2010
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6.1 Underground Mines

Equipment / Product Code	Ex Certificate Number	Ex Certification Code
RockMonitor XR Reader TX5003.06(.XX...)	IECEx ExTC 18.0031X	Ex ia I Ma -20 °C □ Ta □ +50 °C
RockMonitor XR Reader TX5003.19(.XX...)	TÜV 19 ATEX 8459 X IECEx ExTC 18.0031X	I M1 Ex ia I Ma -20 °C □ Ta □ +50 °C

6.2 Conditions of Use:

The following Specific Conditions of Use apply to the ATEX and IECEx certificates (TÜV 19 ATEX 8459 X and IECEx ExTC 18.0031X respectively):

The following parameters must be observed when connecting this equipment:

Telltale cable connector	
U _o	17.64 V
I _o	2.03 A
P _o	4.16 W
C _o	10.64 μF
L _o	83 μH
L _o /R _o	48 μH/□
U _i	17.64 V
C _i	Negligible
L _i	30 μH

Charge cable connector	
U _m	26.66 V

USB cable connector	
U _m	8.1 V

The Charge and USB connectors are only used when the equipment is in a non-hazardous area.

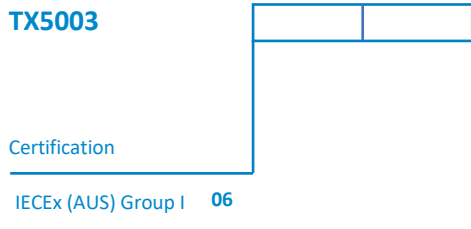
The TX5003 RockMonitor XR Reader shall only be used when in the leather pouch provided.

7. Technical information

7.1 Product Options

TX5003 RockMonitor XR Reader

Product options:

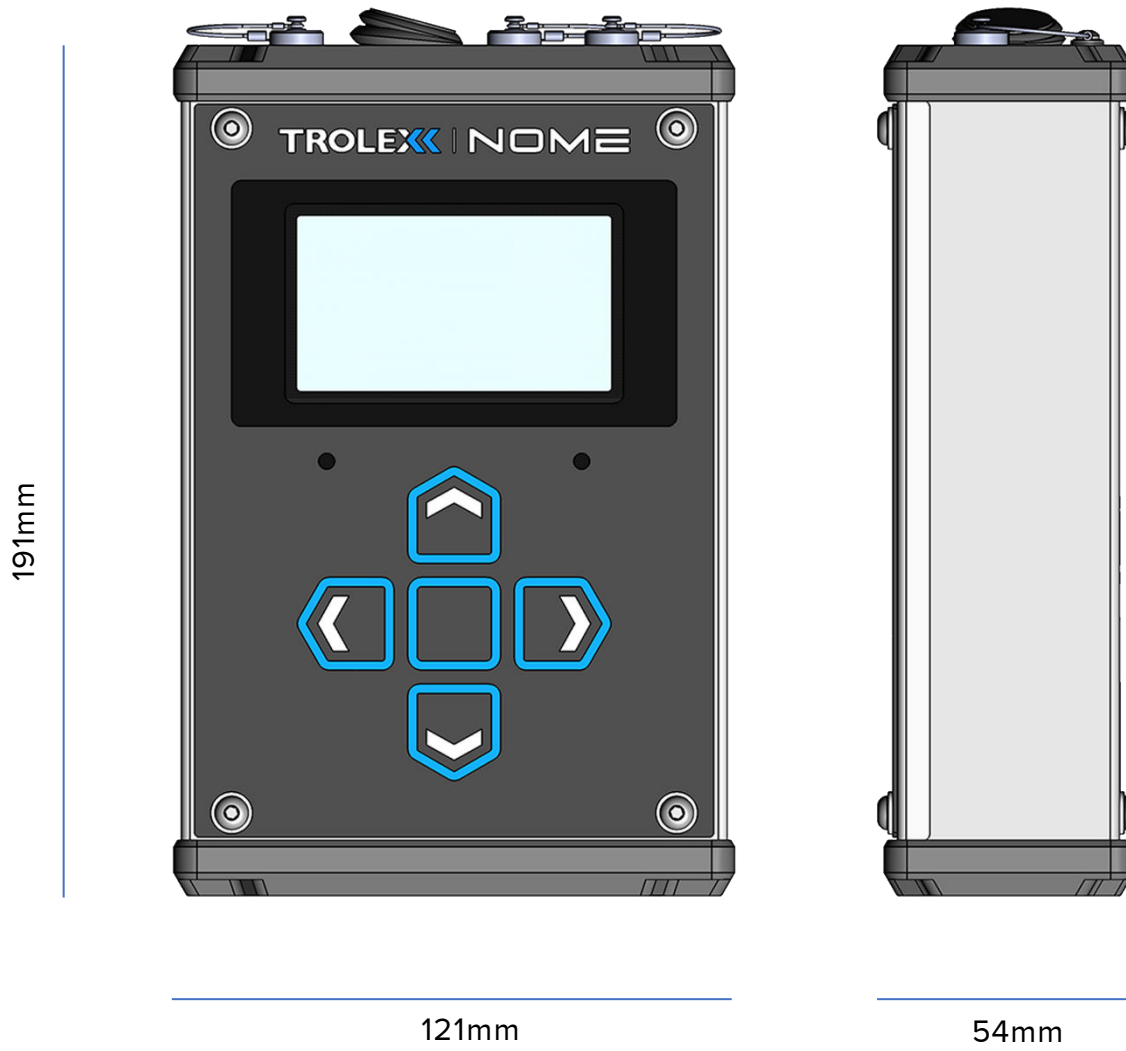


7.2 Product Specification

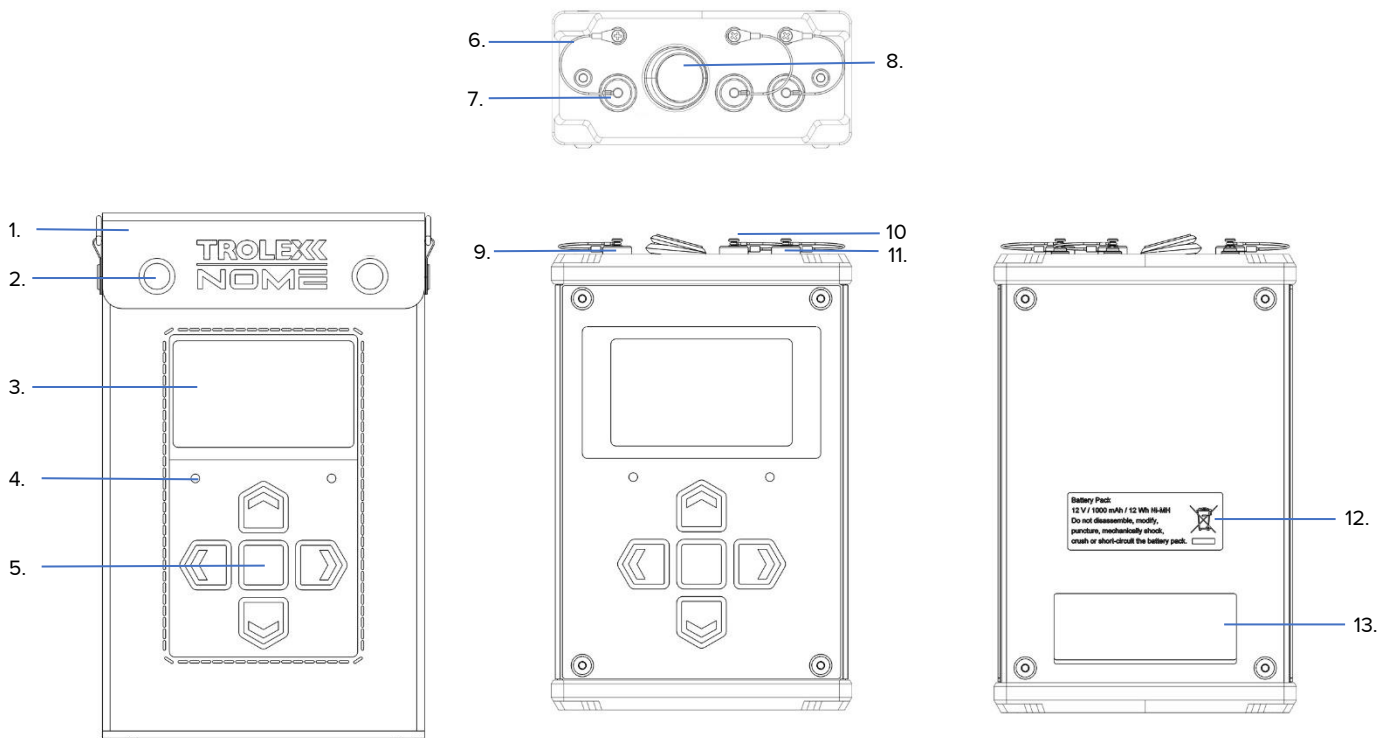
Technical Specification

Operating temperature:	0°C to +50°C
Storage temperature:	-20°C to +50°C
Humidity:	10 to 98% RH (non-condensing)
Protection classification:	Dust and Waterproof to IP54
Housing materials:	SS316, Acetyl
Protective case:	Custom Leather
Net weight:	1.1kg no protective case, 1.4kg with case
Battery:	Rechargeable Ni-MH
Battery run time:	Up to 12 hours
Battery charge time:	6 hours (Approx. 1.5hrs for 90%).
Recharge capability:	Several hundred
Display:	128 x 64 pixels LCD with backlight illumination
User interface:	Keypad (membrane)
Indicators:	1 x Green high brightness LED - Heartbeat 1 x Red high brightness LED – Telltale network
Communications:	Telltale network, USB and power push in connectors
Number of telltales:	Up to 150
System data refresh:	3-10 minutes (dynamic depending on system size)
Data download:	External USB interface
Instrument data storage:	8GB
Certification:	See section 6

7.3 Product Dimensions



7.4 Main Parts



- | | |
|------------------------------|-------------------------|
| 1. Leather carry case | 8. Power switch |
| 2. Case closure snap buttons | 9. Charging port |
| 3. Display | 10. USB port |
| 4. Status L.E.D's | 11. Telltale port |
| 5. Navigation keypad | 12. Battery label |
| 6. Connector IP cap lanyard | 13. Certification label |
| 7. Connector IP cap | |

8. System Connection and Commissioning

8.1 Safety Precautions

Refer to Section 4 and 5 of this user manual before undertaking the connection of the Portable Reader to a RockMonitor XR system. Prior to commissioning and first use, the product shall be inspected for any visible damages and integrity of the enclosure. Never use a product that has a damaged housing in hazardous locations.



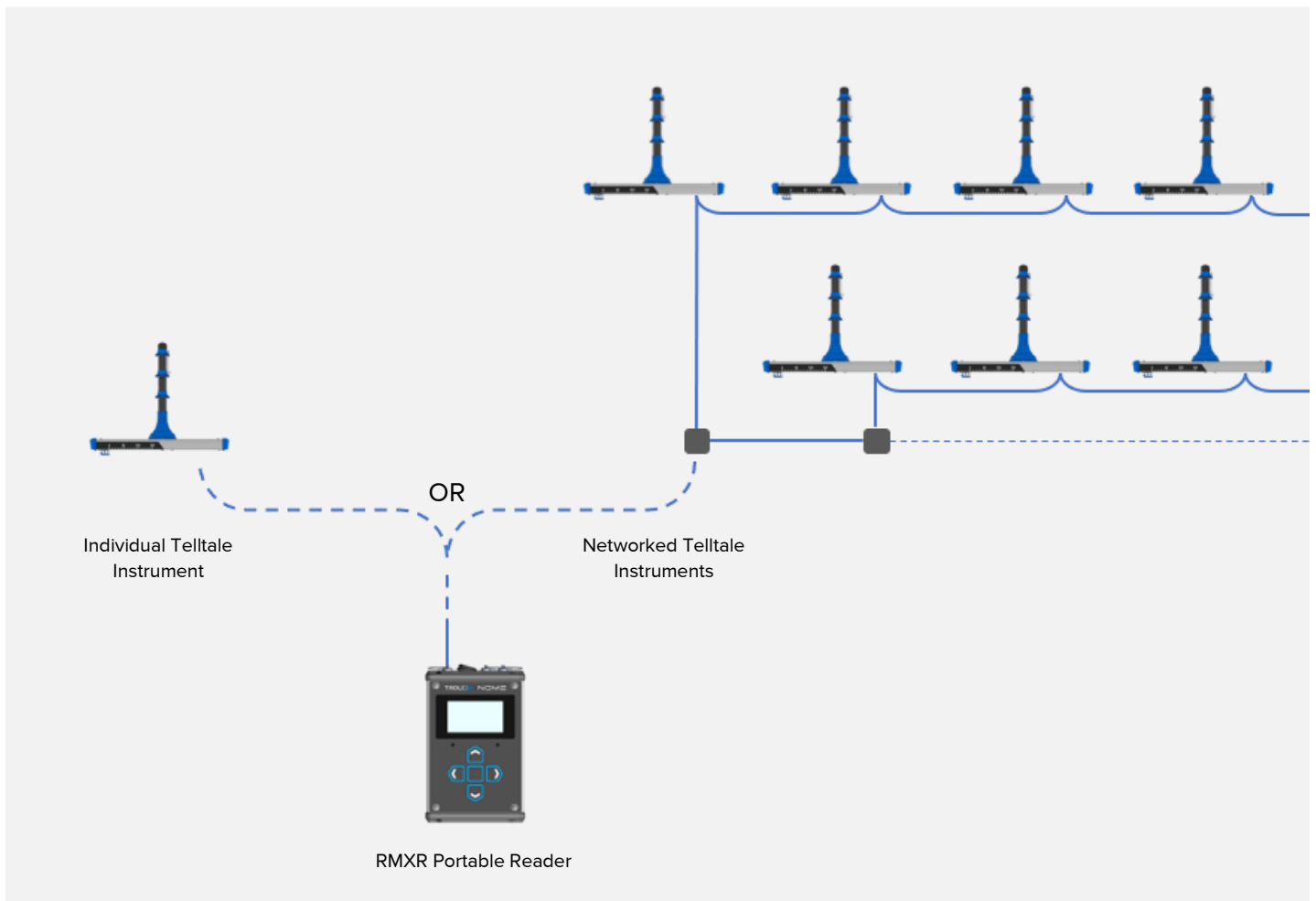
WARNING: Only a single control device may be connected to the telltale network at any one time. Before connection the portable reader to the network, ensure that any RockMonitor XR Controller installations have been disconnected.

8.2 Connection Details

Using the 'Telltale Network Connection Cable' supplied and detailed in Section 4, the Portable Reader can be connected to telltale instruments or the telltale network as required. The diagram below details the options for connection.



WARNING: Prior to commissioning and first use, the instrument should be inspected for any visible damages and integrity of the enclosure. DO NOT USE the instrument in a hazardous environment if damaged.



8.3 Telltale System or Instrument Connection

A connection to individual telltale instruments or networked telltales is made using the 'Telltale Network Connection Cable' supplied. For both connection scenarios, the following steps apply.

1. On the top face of the portable reader, remove the IP cap from the telltale connector socket.
2. Whilst the portable reader is switched 'OFF' connect the Telltale Network Connection Cable to the socket marked 'Telltale'.
3. Using the corresponding mating network connector halve, connect to an individual telltale, junction box or telltale network as required.
4. Power 'ON' the portable reader to apply local power to the connected telltale instrument(s).
5. The loading screen will display for several seconds until the user is presented with boot options.
6. The user will be presented with two options; Discover telltales; Controller/Reader setup only.

Note: If it is not the first time the unit has been powered with the telltale network connected then the Portable Reader will give the option to 'Load previous setup'. Choosing this option will load the previous network configuration. Any new devices connected to the network will be automatically added and configured within a few minutes.

7. Controller/Reader setup only; selecting this option will ensure that the power to the telltale network remains off and allows the user to change controller settings e.g. display brightness. This would typically be used when the telltale network is not yet installed but the user would like to configure and check the communications network.
8. Discover telltales; selecting this option will trigger the controller/reader to search for all connected telltale devices.
9. Once discover telltales has been selected the user is presented with the option to select the number of expected telltales on the network. This is to allow the optimization of the setup time, reducing the amount of time the user must wait for the network to configure.
 - Single Telltale
 - 50 or less
 - More than 50
 - More than 100

Note: if the user selects the incorrect value then the controller/reader will still configure the network, but it will take longer than if the correct option had been selected. There may also be a 20s delay whilst the network boots up to allow Telltale instruments to wake up without overloading system power. (A red LED flashes when communicating with the network).

10. The screen will then display the number of telltale devices found, automatically incrementing every time a new device is located on the network. This may take several minutes.
11. Once the Portable Reader has discovered all telltales the screen will display the total number of discovered instruments. Press 'down' to skip if required. At the main screen the device will show connected instruments and telltales that are waiting to be configured.
12. Once all telltales have been configured, the telltale network is fully initialised and the Portable Reader will start logging data.

Note: Telltale instrument information is polled and displayed in order of discovery.

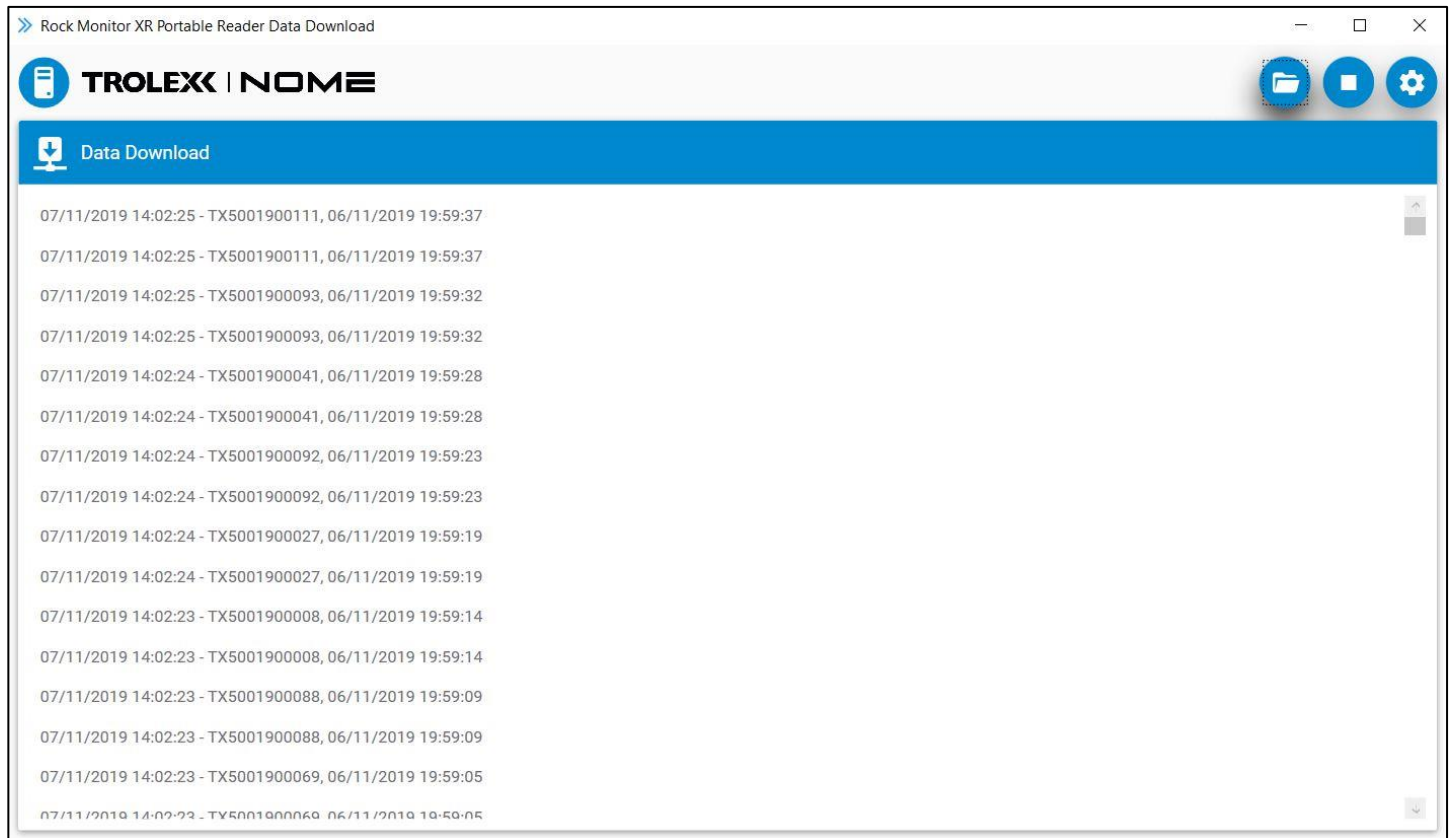


WARNING: DO NOT open or remove the Portable Reader from the leather carry case to connect to a telltale network.

8.4 Portable Reader Download Application Software

During data logging applications, the Portable Reader caches and stores information from the connected network which can be reviewed above ground using the download application software.

The Portable Reader application software is available for download and installation from Trolex|Nome LTD or via an authorised distribution partner and is specifically designed for the capture of data sets collected and cached by the Portable Reader. Installation and commissioning of the Portable Reader Download application software is covered in the separate user manual and installation guide.



Note: The application software is not required for general Portable Reader operation.

In standard operation, the application downloads and logs information direct to CSV file format.

9. Instrument Functions

The following sections detail the operating functionality and modes of the RockMonitor XR Portable Reader.

9.1 Operating Modes

The instrument has two functional operational modes, Commissioning and Auto wake up (data logging) mode. The main notable differences between the two modes is instrument sleep and battery saving functionality when in use.

- Commissioning Mode

Commissioning mode is used during installation (telltale setup) and system fault finding. After an installation or fault-finding function has been carried out followed by a period of inactivity, the unit will automatically go to sleep (screen sleep 30's, instrument sleep 60's default).

- Auto Wake Up Mode (data logging)

Auto wake up mode is used when a RockMonitor XR system is operational and the Portable Reader is required to be connected to a telltale network to log data for a working shift. In this mode, the instrument will automatically wake up during defined periods, cache, poll and log the connected system data before returning to sleep mode.

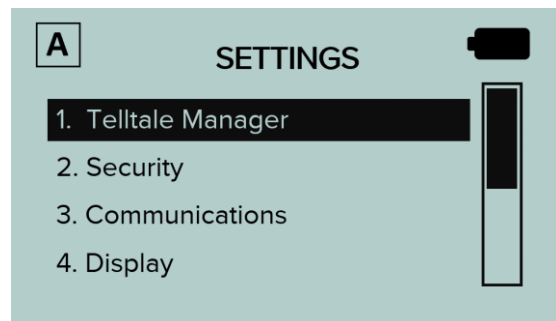
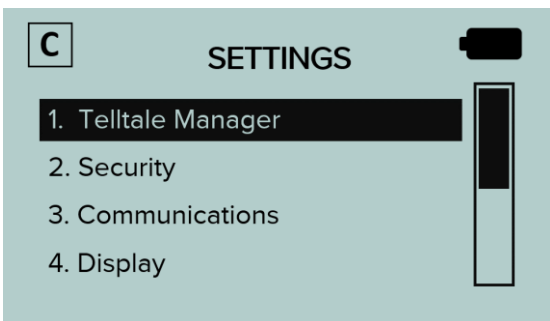
Data logging periods can be manually set to allow the appropriate monitoring of telltale movement data and to extend the data logging time period based on the number of telltales connected where required. Refer to the table in Section 5.7 for network size logging times.

By Default, the Instrument is set to boot up in Commissioning mode on first use. Selection of operating modes is done by navigating through the main menu structure and the instrument will remember the selected mode between power cycles.

Both operational modes are identified by an icon positioned in the top left corner of the display, see below.

C = Commissioning Mode

A = Auto wake up Mode (data logging)



9.2 Telltale Commissioning

The RockMonitor XR system is designed to be plug and play. Once the network of RockMonitor XR Telltales is connected to the RockMonitor XR Portable Reader and power applied, the Portable Reader will automatically configure the connected instruments.

- Auto-detect Telltales or Network

The Portable Reader will automatically detect and configure any new telltales connected, whether a single device or multiple devices. Even if newly installed telltales are connected to an existing network of telltales that has already been configured and is recording data, the new devices will be automatically detected and configured.

- Adding New Telltales

Telltales can be added to a system and connected when live, requiring no need to disconnect power from the telltale network. The Portable Reader will automatically discover and configure new instruments added to the network.

The Portable Reader can also configure multiple telltales that are simultaneously connected to a system. For example, when a chain of telltales have been installed into a mine roadway before connection to the system.

- Removing Telltales

Telltales can either be physically removed or removed via the menu system on the Portable Reader Main menu > Telltale manager > Telltale info > Config > Remove Telltale.

If a unit is physically removed having been previously detected and configured by the controller/portable reader, the telltale will appear as inactive. It can then be removed on the Portable Reader via the first step above.

Note: If a telltale is incorrectly removed via the Portable Reader, the user must tell the Portable Reader to rediscover the whole network in order to reinstate the incorrectly removed telltale.

- Apply Meter Marks

If the user would like to set the meter mark (positioning identifier indicating distance along a roadway) for each telltale, this can be done via the menu on the Portable Reader.

1. Hold the centre button to access the main menu
2. Select 'Telltale manager'
3. Select 'Telltale info'
4. Navigate to the telltale you would like to edit using the next and previous buttons
5. Select 'Config'
6. Select 'Edit meter mark'
7. Enter the meter mark
8. Select 'Set'
9. Repeat this for all telltales

Note: The functionality of the Portable Reader is not synchronised with the Trolex Core application. Apply meter marks using the Portable Reader will not be registered if connected to the Trolex Core application.

- Setting Telltale 'Zero' Mark

During installation RockMonitor XR Telltales are required to be 'Zero'd' before considered to be fully commissioned. Setting the Zero Mark is the act of manually setting the anchor height measurement scale markers to 0mm and aligning the electronic reading that is reported by the instrument.

Setting the Telltale zero mark can be completed for individual telltale instruments or an entire network.

- Setting Individual Telltale 'Zero' Mark

Telltales are set to 'Zero' using the Portable Reader by navigating to the following:

Main menu > Telltale manager > Telltale info > Config > Zero Telltale.

1. Mechanically set the position of the measurement scale marker to 0mm for the connected telltale.
2. On the Portable Reader select 'Zero Telltale'
3. The Portable Reader will confirm 'Zeroing Telltale' during procedure.
4. The Potable Reader will confirm 'Telltale Zero'd' when complete.

Note: Users can also access Telltale functionality by pressing the 'right' button via the main menu display screen.

- Setting System Telltale 'Zero' Mark

All networked Telltales can be set to 'Zero' using the Portable Reader by navigating to the following:

Main menu > Telltale manager > Commission > Zero ALL Telltales.

1. Mechanically set the position of the measurement scale marker to 0mm for ALL connected telltales.
2. On the Portable Reader select 'Zero All Telltales'
3. The Portable Reader will ask the user to confirm that all telltales are to be zero'd.
4. Select to 'Confirm' or 'Abort' system zeroing.
5. The Portable Reader will confirm 'Zeroing' procedure (Zeroing Telltale 1 of X).
6. The Potable Reader will confirm when complete.

Note: During the Zeroing procedure, if at any time the Portable Reader fails to complete the action, an error message will be displayed 'Error, Failed to Zero Telltale'. If the error message is displayed, attempt the 'Zero' procedure again.

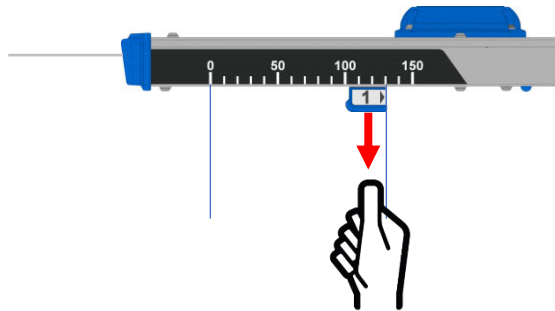
- Apply Movement offset (Extending Electronic Range)

The Telltale has a measurement range of 0 to 150mm, however this range can be extended if required. There is facility to manually reset the anchor indicators back to 0 to allow for further travel whilst maintaining the current readings. To reset the telltale, follow the procedure below:

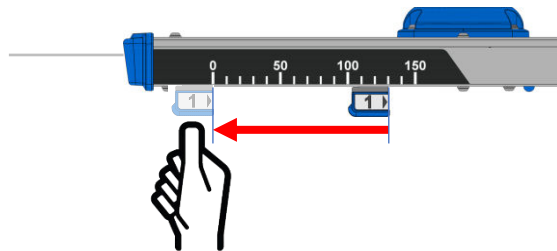
1. On the RockMonitor XR Portable Reader, navigate to *Settings Menu > Telltale Manager > Telltale info.*
2. Navigate to the telltale to be reset using Next /Prev.
3. Select Config, followed by Reset w/ offset. Follow the instructions on screen to confirm the reset.

Note: Depending on how the alarms have been configured, this action may trigger an alarm until the telltale is mechanically reset.

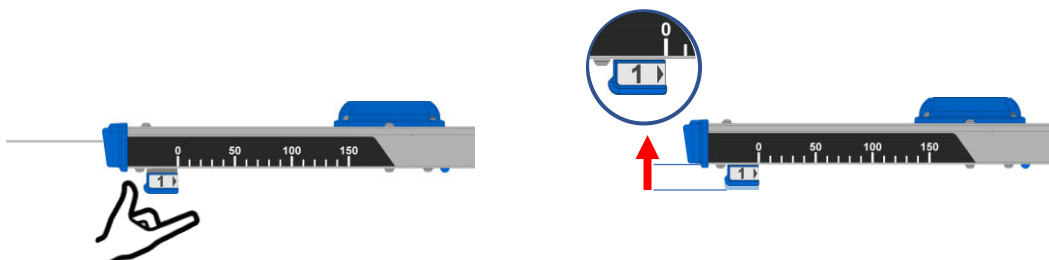
4. The telltale will now use the current readings as an offset for all future readings.
5. On the telltale itself, pull the reset handle down.



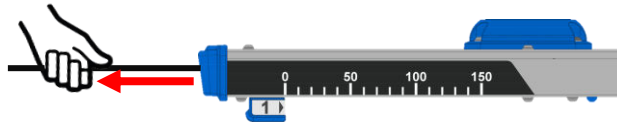
6. Whilst holding the handle down, slide the handle back to the zero position on the scale.



7. Release the handle. Ensure the handle snaps upwards against the device and is not stuck in the down position.



8. Pull on each cable coming out of the device to remove slack in the line.



To remove the offset:

1. Repeat steps 1 and 2 above.
2. Select Config, followed by Remove offset.
3. Follow the instructions on screen to confirm.

9.3 Telltale Information

During system connection, the Portable Reader allows users to view individual telltale information, detailing the following:

- Serial Number

Each telltale serial number is displayed for instrument identification.

- Meter Mark

Each telltale assigned meter mark is displayed for instrument location mapping. (Not synchronised with Trolex | Core).

- Unit Number

Details the number in which the instrument was discovered by the Portable Reader, in reference to the total amount of system instruments discovered. This number is randomly allocated on every network discovery.

Note: Instruments can be sorted using the three numbering variations listed above. Trolex recommend that a meter mark is assigned to every unit, and sorting is filtered by known mine locations.

- Last Seen by Portable Reader

Details the time between last contact with the telltale instrument.

- Status

Indicated if the telltale instrument is 'Active' or Inactive'.

- Anchor height measurements

Details the measurement movement of each anchor.

To view live instrument data:

From the default screen press the right arrow to show displacement readings as well as telltale information such as serial number, meter mark, status.

Pressing right again will show telltale supply voltage, current consumption and temperature as well as any error information.

Left from the default screen will display the status of the Portable Reader itself, including serial number, date and time and power status.

By default, the system will automatically scroll through the network, displaying information for each telltale one device at a time.

The up and down key can be used to quickly navigate to a particular telltale. Pressing of the up down button will pause the auto-scroll feature for 30 seconds to allow the user to navigate to the desired telltale.

CONTROLLER STATUS

SN: TX5001999991


07/11/2019 15:57:09

Input voltage: 13.6v

Line current <1.0mA

TX5001999991

Dist: 10m	1	4.0mm
Unit: 1/1	2	2.8mm
1 mins ago	3	7.4mm
Active	4	2.5mm



TX5001999991	20.7C
Dist: 10m	15.2V
Unit: 1/1	<u>4991uA</u>
Line: 0.3mA	

9.4 Instrument Fault Finding (Debugging)

The portable reader is primarily a commissioning and debugging tool to aid with installation of the telltale network and help fault find if the network becomes inactive. Using the reader to check individual telltales on installation ensures that the devices are working correctly prior to connection to the Portable Reader.

- Faulty Telltales

Telltale devices displaying faults will either appear as inactive on the portable reader or not appear at all.

If a device displays as inactive or cannot be found, try disconnecting and reconnecting the telltale to the network.

The portable reader can also be used to connect directly to telltale, allowing checking of the voltage and input current to ensure they are within acceptable limits.

If disconnecting and reconnecting of the telltale does not solve the issue, then please contact Trolex | Nome Ltd or approved territory distributor for technical support.

- Telltale Errors

Telltale errors are displayed for each instrument on the 'Telltale information' screen in the bottom right of the display.

- Inactive Telltales

Inactive instruments can be viewed either via the Trolex|Core application software or directly on the Portable Reader. If an inactive instrument cannot be recovered, then it should be removed from the network.

- Short Circuit (Telltale Network)

If a short circuit is detected by the portable reader, the screen will display 'Short circuit detected' and automatically disconnect power to the telltale network.

Depending on the option selected in *main menu > system > Short circuit reset*, the portable reader will either display 'Power will auto-reset' and attempt to automatically recover periodically or display 'Power latched off' and give the user the option to attempt to recover the network.

If short circuit detection is set to latching, the portable reader will turn off power to the network and remain off until an operator manually power cycles the portable reader.

If the short circuit has been successfully resolved, then the portable reader will resume with the previous configuration.

- Line Faults

The RockMonitor XR System line current should be equal the total draw of the connected telltale instruments ($0.61\text{mA} \times n$). Note: a $\sim 4\text{mA}$ additional draw will be seen when a telltale is active or turning on.

If the current draw is too large = Short on the line

If the current draw is too low = Open fault on the network

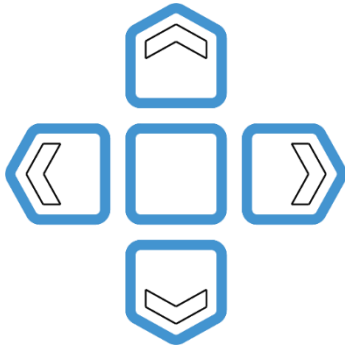
- Replacing Telltales

The telltale is designed to be a one-time fit into the bore hole, due to the retention required to hold the device in place. If a faulty instrument does need to be removed from a bore hole, then this is possible, but it would require a high degree of force to extract. Take any relevant precautions when doing this to minimise the risk of injury.

10. Controls and Indicators

10.1 Navigation

The Portable Reader information software is navigated using the on-device keypad and display. The keypad consists of four directional keys and a central enter key to allow the scrolling, selection and input of data into the instrument.



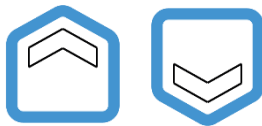
Directional Keypad



User Interface

10.2 Main Function Keys

Up and Down keys



A single press of the Up or Down key is used for the following display functions:

Navigation of vertical menu structures

Increment/decrement setting values

Left and Right keys



A single press of the Left or Right key is used for the following display functions:

Navigation of entry parameters

Navigation of display screens

Enter Key



A single press of the Enter key is used for the following display functions:

Select highlighted option whilst in menu structures

Confirm input value data entry

11. General Operation

11.1 User Interface Display

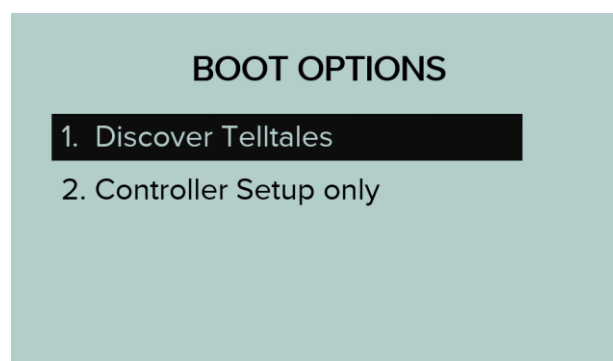
On initial power up of the RockMonitor XR Portable Reader the graphical display will show the following screens. After first use, recorded data log entries and any custom user input values assigned where required, will be saved in the instrument memory and on consecutive power cycles the Portable Reader will always display the following start up screens.

Note: The instrument requires no custom configuration to perform standard operation, however, custom configuration values can be entered where required through the setup menu.

Portable Reader Power On > Title Card > Boot Options



Title Splash Screen



Boot Options Screen

11.2 Portable Reader Boot Option Menu

The following map details the navigation through the Portable Reader boot option display screens. Users can select between 'Discover Telltales' or 'Controller Setup Only' menu options.

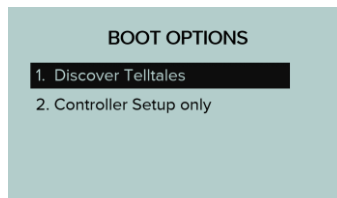
By selecting 'Discover Telltales', the instrument will automatically begin searching for and configuring connected telltale instruments.

By selecting 'Controller Setup Only, the instrument will present the settings structure list which allows detailed set up and configuration of the system.

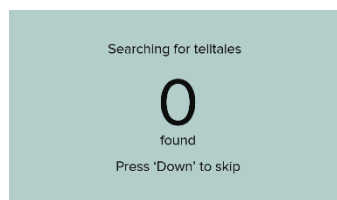
Title Screen



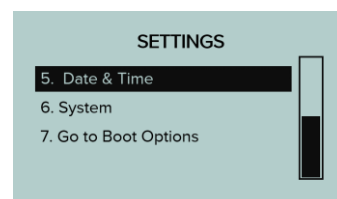
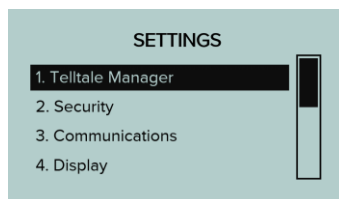
All Channel Values
(Default landing screen)



Discover Telltales



Controller Setup only

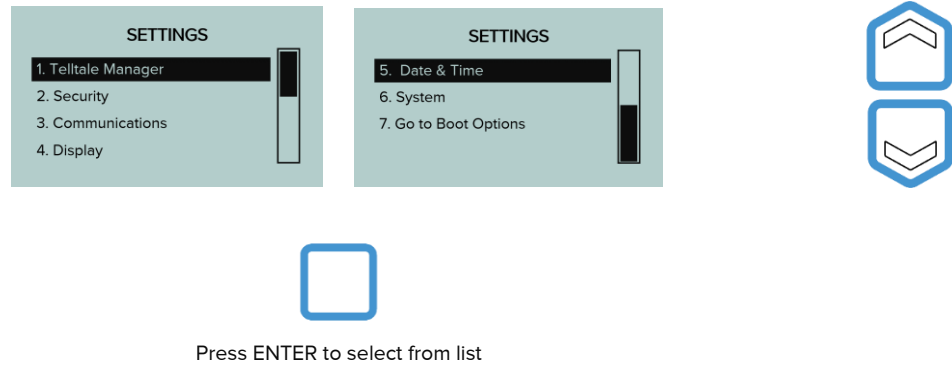


Press ENTER to select from list

11.3 Controller Only Settings Menu Structure

The following settings can be configured within the Portable Reader settings menu by selecting the required field when highlighted within the black selection bar.

Settings Menu



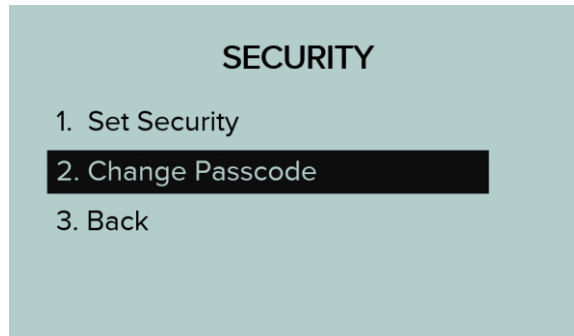
Each settings menu allows users to access the following information or selection options.

- **Telltale Manager**
Proceeds to connected telltale status information and configuration options.
- **Security**
Configure and select to set instrument passcodes.
- **Communications**
Configure and select instrument communications protocols or download logged system information.
- **Display**
Configure the on-device display and graphical interface.
- **Date & Time**
Configure the instrument date and time settings.
- **System**
Review, configure and update the instrument system settings.
- **Go to Boot Options**
Return to Boot Options screen.

11.4 Set Device Passcodes (Security)

The Portable Reader supports that application of security passcodes 'On/Off' and Passcodes can be entered, set and changed in the 'change passcode' menu.

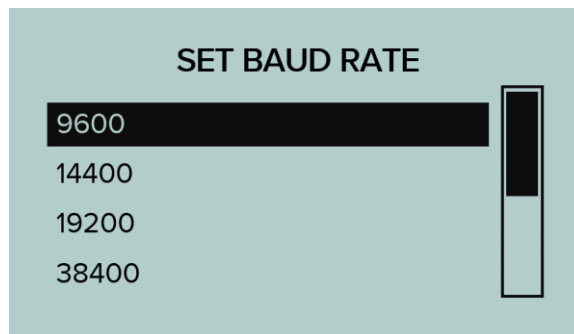
Settings > Security > Change Passcode



11.5 USB to Serial Communications

The Portable Reader has a user configurable serial baud rate. It is possible to configure the baud rate through the on-device display menu.

Settings > Communications > Baud Rate



Note: The Portable Reader and Download software must both be configured to the same baud rate setting to perform the system dataset download to .CSV function.

- 9600 (Default)
- 14400
- 19200
- 38400
- 57600
- 115200

11.6 Display

The Portable Reader has a 128 x 64 dot matrix display with backlight. Users can select and configure display contrast and backlight brightness. It is also possible to set power saving mode

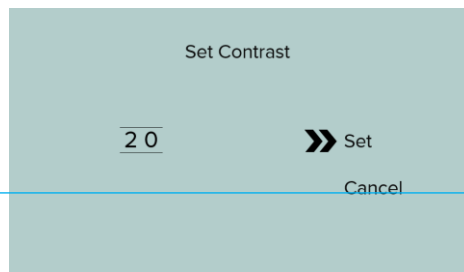


with display sleep functionality.

11.7 Adjusting Display Contrast

The Portable Reader display can be adjusted to align the contrast ratios with the installation environment.

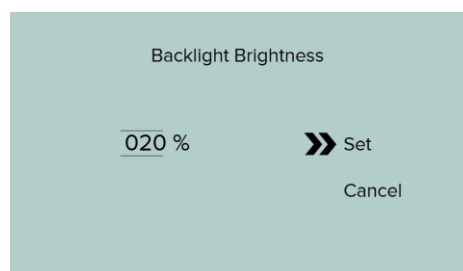
Main menu > Display > Set Contrast.



11.8 Set Display Backlight

The Portable Reader display can be adjusted to align the backlight brightness with the installation environment.

Main menu > Display > Backlight Brightness.

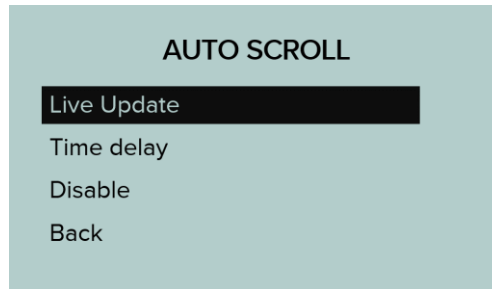


11.9 Set Display Auto Scroll

The Portable Reader display can be set to Auto Scroll through live telltale instrument data where required.

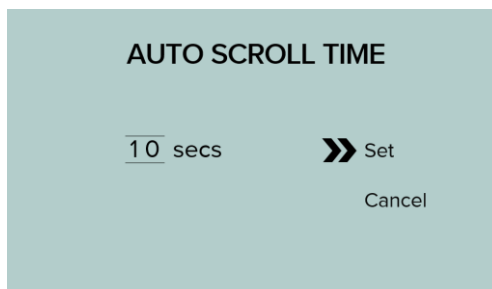
Users can select from 'live update' and 'time delay modes' or select to disable the functionality.

Main menu > Display > Auto Scroll.



Auto scroll time can be user configured to determine live data scrolling time. During live data readings, telltale auto scrolling can be skipped by pressing the right or left arrow key.

Main menu > Display > Auto Scroll Time.



11.10 Set Date & Time

The Portable Reader date and time stamp can be configured to suit the installation location.

Main menu > Date and Time > Set Automatically.

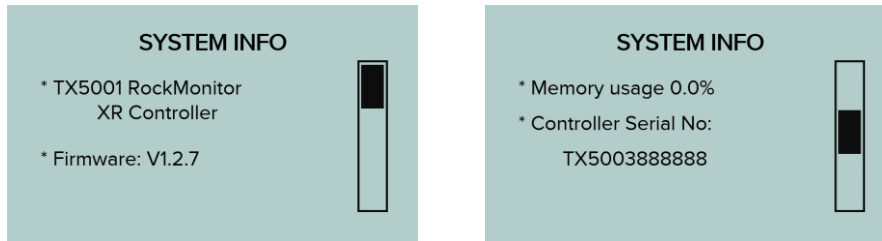
Main menu > Date and Time > Set Manually.



11.11 System Information

The system information menu allows users to view the functional status of the RockMonitor XR Portable Reader.

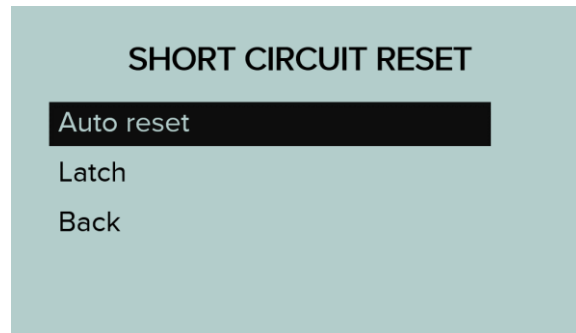
Main menu > System > System Info.



11.12 Short Circuit Reset

The Portable Reader can be configured to 'Auto Reset' or 'Latch' during periods of network short circuit detection.

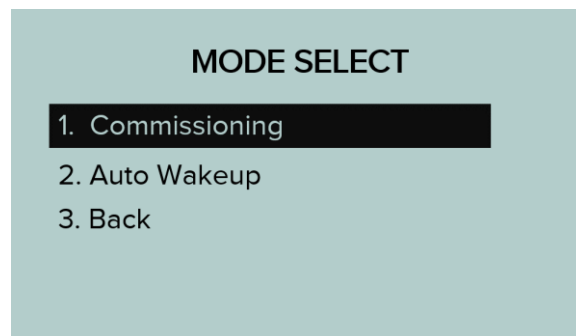
Main menu > System > Short Circuit Reset.



11.13 Power Saving

The Portable Reader power saving mode selection can be configured for 'Commissioning' or 'Auto Wakeup' functionality.

Main menu > System > Power Saving.



Within Commissioning mode, users can set the instruments display and device sleep times.

Within Auto Wakeup mode, users can set the data logging intervals (every 0.5Hrs).

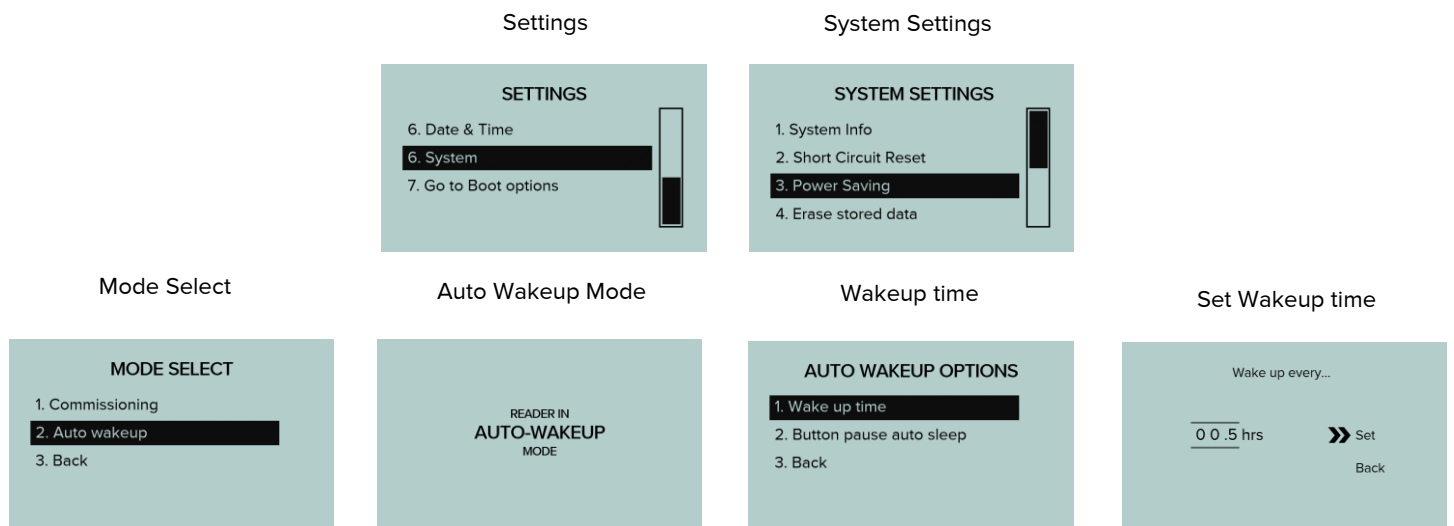
11.14 Network Data Collection

During network data collection, the instrument will automatically wake up during defined periods, cache, poll and log the connected system data before returning to sleep mode. Refer to the table in Section 5.7 for network size logging times.

Data logging periods can be manually set to allow the appropriate monitoring of telltale movement data and to extend the data logging time period based on the number of telltales connected by following the steps below. Increments can be modified in 0.5-hour increments.

Note: Default Auto Wakeup time is 1hr.

Main menu > System > Power Saving > Auto Wakeup > Wakeup time > Set time.



11.15 Erase Stored Data

Any logged data stored on the Portable Reader can be permanently erased from the device if required.

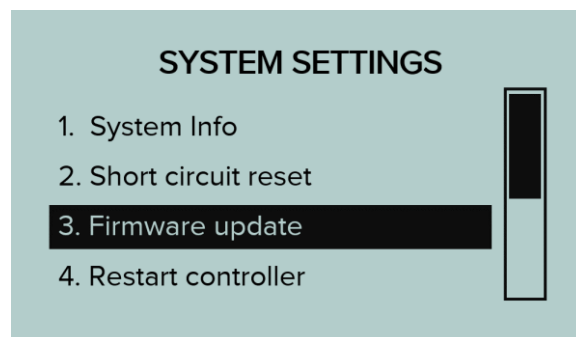
Main menu > System > Erase Stored Data.



11.16 Firmware Update

On notification of firmware update and release, the Portable Reader can be updated via the firmware update menu below. The instrument requires the update to take place via the connection to a PC via USB connection loaded with the latest firmware.

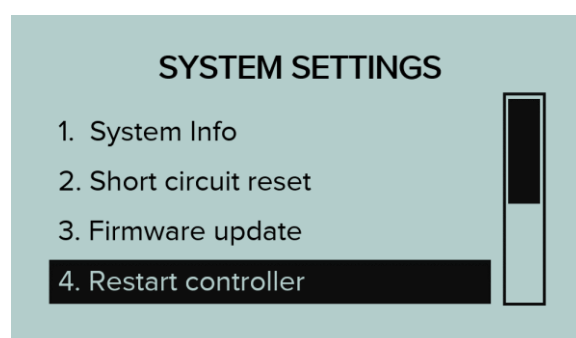
Main menu > System > Firmware Update.



11.17 Restart Reader

The Portable Reader can be forced to restart and reboot through the 'Restart Reader' menu option.

Main menu > System > Restart Reader.



11.18 Data Download

The Portable Reader allows users to download collected data sets via the 'data download' menu. Data is stored on the instrument internal memory and can be locally downloaded onto a PC when connected to the Portable Reader Download application via the external USB connector.

To download the information stored on the Portable Reader:

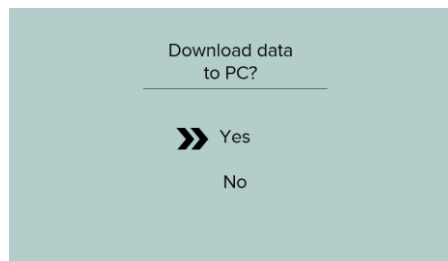
1. Ensure that the Trolex | Nome RockMonitor XR Portable Reader Data Download tool is installed on the connected PC.
2. Open the Portable Reader Data Download tool.
3. Connect the portable Reader to the PC USB Serial Port and power 'ON'.
4. Check the Baud Rate setting on the Portable Reader.
5. In the PC application, click the settings icon to open the settings menu.
6. Set the Baud Rate to the same number displayed by the Portable Reader.
7. Select the correct PC Com Port that the Portable Reader is connected to.
8. Press save and exit the settings window.
9. In the PC application, click the 'Play' button to open the Com Port for data download.
10. On the Portable Reader, navigate to *Main Menu > Communications > Download Data*.
11. When prompted, select download data to PC 'Yes'.
12. The application will begin to receive the data from the Portable Reader and store individual .CSV file for each reading, which can be accessed by clicking the folder icon in the PC application.

Collected data can be retrieved from the Portable Reader instrument in two methods by either selecting the 'Download All' or 'Download New' data sets.

Selecting the 'Download All' tab will proceed to notify users of the total number of records to be downloaded.

Selecting the 'Download New' tab will proceed to notify users of the number of records, started from the last download state. Note: This function works based on reading the last file name downloaded to the connected USB device and only downloading the data set recorded after the last download.

Main menu > Communications > Download Data.



The .CSV file generated contain instrument information under the following headings:

Timestamp	Anchor 1	Anchor 2	Anchor 3	Anchor 3	Temperature	Supply V	Current
-----------	----------	----------	----------	----------	-------------	----------	---------

12. Instrument Configuration

12.1 Default Settings

The RockMonitor XR Portable Reader has been programmed with factory default settings prior to delivery which are detailed in the table below.

Use mode:	Commissioning
Default passcode:	0000
Security:	Off (default)
Data caching:	On (default)
RS585 baud rate:	9600
Telltale polling scheme:	As discovered
Backlight:	25% illumination (for power saving)
Backlight colour:	Green
Screen sleep:	30s (commissioning mode)
Device sleep time:	60s (commissioning mode)
Default wake up time:	1 hour (auto-wake up mode)

13. Maintenance

The maintenance of the RockMonitor XR Portable Reader must only be carried out by competent personnel. Maintenance shall be considered with reference to the local safety regulations and authorities.

13.1 Visual Checks

Periodic visual checks should be carried out to assess if there are any issues arising with the instrument. Check for:

1. External damage to the instrument. Plastic parts should not be cracked or broken which could affect the IP rating of the instrument.
2. Internal or external damage to wiring that is connected to the instrument.
3. Interface connector IP sealing caps are present.
4. Labels on the instrument are still in place and are not peeling or discolouring. Ensure all labels are clean by following 13.2 below.

13.2 Cleaning Labels

Although protected by the leather carry case, it is recommended to clean the instrument periodically to ensure the instrument display and keypad is clean and readable with a damp cloth.

14. Troubleshooting

The following sections detail and contain information to assist with the troubleshooting of instrument functionality if required. If an issue is non-resolvable based on the information below, please contact Trolex | Nome Ltd or approved territory distributor.

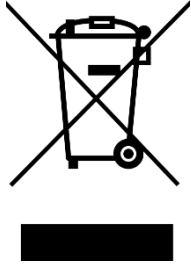
14.1 Fault Codes

The following codes relate to on-screen warnings that the Portable Reader will display when a fault is encountered during normal operations.

Code	Fault Name	Fault Description	Fault Check
0x0002	Low supply voltage	Detected that the supply voltage is too low	Charge the instrument Contact Trolex or approved distributor if this fails.
0x0004	Date and Time not set	The instrument date and time has not been set.	Set date and time.
0x0009	Failed to load system settings	The instrument failed to recall and load previous system settings	Power cycle the instrument Contact Trolex or approved distributor if this fails.
0x0101	Internal storage is full	The instrument has reached the maximum data storage capacity.	Manually clear instrument data set.
0x0107	Failed to detect internal storage	The instrument has lost connection to the built-in memory module.	Power cycle the instrument Contact Trolex or approved distributor if this fails.
0x0601	Too many telltales detected.	The instrument has detected too many telltales to communicate with.	Power cycle the instrument Contact Trolex or approved distributor if this fails.

15. Disposal

16.1 Waste of Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU)



This symbol, if marked on the product or its packaging, indicates that this product must not be disposed of with general household waste.

In the European Union and many other countries, separate collection systems have been set up to handle the recycling of electrical and electronic waste.

At the end of the product's life, do not dispose of any electronic sensor, component or instrument in the domestic waste. Contact Trolex or the distributor for disposal instructions.

16. Technical Support

Our technical services team are available to provide expert ongoing technical assistance and technical support packages tailored to your specific requirements.

Please contact our technical services team:

Trolex

Tel: +44 (0) 161 483 1435

Email: service@trolex.com

Nome Services

Tel: +61 (0) 437 754 904

Email: service@nomeservices.com.au

17. Disclaimers

The information provided in this document contains general descriptions and technical characteristics of the performance of the product. It is not intended as a substitute for and is not to be used for determining suitability or reliability of this product for specific user applications. It is the duty of any user or installer to perform the appropriate and complete risk assessment, evaluation and testing of the products with respect to the specific application or use. Trolex | Nome shall not be responsible or liable for misuse of the information contained herein. When instruments are used for applications with technical safety requirements, the relevant instructions must be followed.

All pertinent state, regional, and local safety regulations must be observed when installing and using this instrument. For reasons of safety and to help ensure compliance with documented system data, only Trolex | Nome or its affiliates should perform repairs to components.

Trolex | Nome Ltd. reserves the right to revise and update this documentation from time to time without obligation to provide notification of such revision or change. Revised documentation may be obtainable from Trolex | Nome.

Trolex | Nome Ltd. reserves the right, without notice, to make changes in equipment design or performance as progress in engineering, manufacturing or technology may warrant.

18. Revisions

Description	ECR	Date	Initials
Initial Release DRAFT	-	08/11/2019	KH
Document Release	-	27/11/2019	KH, NO
Certification updates	5005	31/01/2020	AH
Certification updates	5030	18/02/2020	AH

19. Feedback

If you have any suggestions for improvements or amendments, or find errors in this publication, please notify us at marketing@trolex.com.

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