

OPERATOR MANUAL

EL-ERTK-A2

ERRTS Test Set and Ranger Software



Introduction

The ERTK-A2 Field Test Set is designed to test and evaluate Event Reporting Radio Telemetry System (ERRTS) Field Stations and Store & Forward Repeaters in the field. Facilities allow the testing of the major radio transmission functions and the display of sensor identification and the accumulator values for reports from the station under test.

The Test Set ERT-A2 module is easily programmed for testing Field Stations of various frequencies in the VHF band. The ERT-A2 module can be programmed to any frequency within the 148 to 174MHz band. There is also an audible output to indicate the receiver has heard a valid message, which is useful for monitoring ERRTS signals.

The transmitter power, frequency, and quality of the antenna systems can be easily measured using the Surecom digital VHF SWR & Power Watt meter.

Transmitted data can be checked for integrity using the "ERRTS Ranger" Windows based software provided. ALERT/ALERT2 Frames and IFLOWS Frames are supported.

The Test Set is used in conjunction with a portable computer (not supplied) using Windows Operating systems and may be used as a substitute for either a Field Station, Repeater or a Base Station to assist in fault diagnosis.

The Test Set is portable, contained in a carry case and all devices are powered by internal batteries. The ERT-A2 and VWSR meter can be charged using the supplied plug pack.

Contents of Test Set

The ERTK-A2 Field Test Set is contained in a heavy duty, waterproof carry case which contains a foam insert that provides protection for the components.



The Test Set Includes:

- ERT-A2-CGR-1X Receiver and Decoder
- VSWR Meter & Test Leads
- Built in Battery & Plug Pack Charger
- Programming leads and cables
- Whip antenna

Options Available

- Digital Multi Meter
- Fixed Attenuator & Accessories

Operation

Connections

The ERTK-A2 Field Test Set has been pre-wired to allow easy access to all connection points. These are the main connections that you will need to access (refer to the figure below):



Antenna – You will find a small whip antenna in the accessory box.

Configuration – Configuration port for the ERT-A2 Receiver & Decoder (If configuration of the Base Station is needed i.e., to change Radio frequency, etc.)

Charger for VSWR Meter – This USB port is primarily used for periodically charging the VSWR Meter (when required). **Note:** Supply comes from the internal ERT-A2 battery so prolonged charging of other devices will flatten the battery. Should only be used in emergencies and when the 24V DC charging cable is connected (see below)

Serial Data Out – This connection point is for the Serial data from the ERT-A2 Receiver/Decoder and is used to connect to the Ranger software for displaying Alert data frames.

Power – Turn ON/OFF power to the ERT-A2 Receiver/Decoder.



Charging Port – Charges the ERT-A2 Receiver /Decoder and the VSWR Meter (if connected to the USB Charging socket)

The VHF VSWR and Watt meter



Description

The ERTK-A2 Field Test Set is supplied with a Surecom SW-102 Digital VSWR Watt Meter and frequency counter. This device allows the testing of the cannister transmitter to ensure the Transmitted Power and the Frequency are within allowable limits. Should the frequency drift beyond a certain limit, then the reliability of the communications will begin to suffer.

The SW-102 is a handheld device and is powered by internal rechargeable Li-on batteries, which can be charged from any Micro USB phone charger, or the USB charging socket provided in the case. **Note:** Charging will come directly from the ERT-A2 Internal battery, so the Power switch must be turned ON.

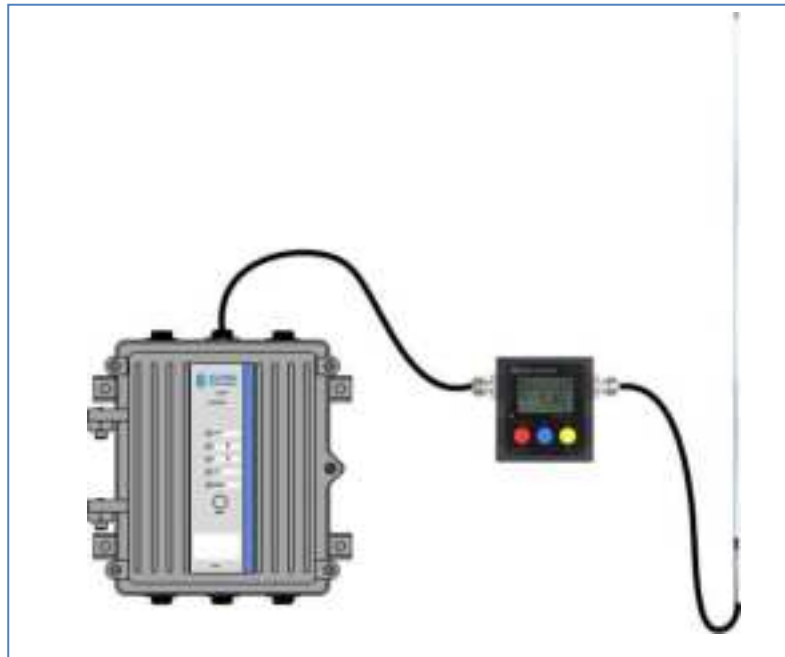


The SW-102 is also able to check the Antenna VSWR by connecting it in series with the antenna using the cables provided.

Connection

In order to measure the frequency and TX power of the transmitter and the Antenna VSWR, it is necessary to connect the

SW-102 inline in between the cannister and the antenna or dummy load. The cables provided should be sufficient for the connections.



Each connector is clearly labelled, connect the TX to the Transmitter and the ANT to the Antenna or if only measuring TX power a suitable dummy load to accommodate the power level.

Note: The ERTK-A2 Field Test Set includes two adapter cables. You need to use *both* cables to connect the ERT-A2 and the Antenna. The ERT-A2 connections are N-Type while the VSWR meter connectors are PL-259 type. The antenna cable will screw directly into the PL-259 ANT connector on the SWR meter but will not provide an RF connection.



The Power Meter or VSWR (Voltage Standing Wave Reflectometer) is used to test the condition of the antenna and co-axial cable assembly. The meter is an "In- Line" variety as it is installed between the transmitter and the antenna co-axial cable.

As it is a ratio, the accuracy of the meter in precise measurement becomes less important, also the SWR provides a constant reference figure for the antenna system independently of the amount of RF Power generated by the transmitter.

The Test Set is supplied with two co-axial test leads for use with connection of the meter to the system under test.

Making a TX power and VSWR Measurement

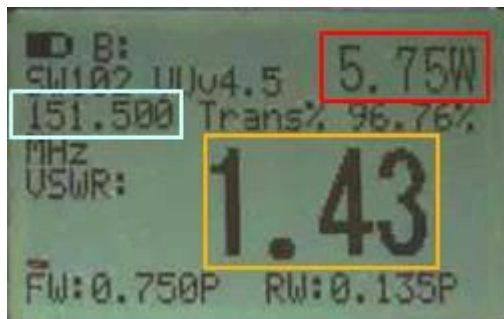
To check the TX power level and VSWR we need to force the cannister to Transmit.

Note: Performing a VSWR check does require the TX power level to be above 2Watt.

In the ERT-A2 this can be done from the terminal menu. It is an option under the “Unit Diagnostic” menu. Select “Radio Tone Reversals” from the “Unit diagnostics” menu.

If using the legacy cannisters, there is an option in the menu for “Tones”.

This will force the radio to send a constant tone which will allow us to see what the TX level and what the VSWR is if an antenna is connected. The display will show similar to the below image:



You can then read the TX Power level (red rectangle) and VSWR (orange rectangle) The reading should not exceed 1:5. You will also be able to see the Transmit Frequency (light blue rectangle).

The display will retain the values until they change or the unit times out and goes to sleep. Pressing any key on the legacy cannister will turn off the transmitter. On the ERT-A2 you will need to select the option “Stop Radio Tones”.

To clear the display, press the yellow button for 2 seconds.

ERT-A2 ERRTS Decoder

Description

The ERT-A2 will receive and decode ALERT (version 1) or ALERT2 radio messages and translate the radio messages into a serial format RS485 to USB Serial converter suitable for the portable computer.

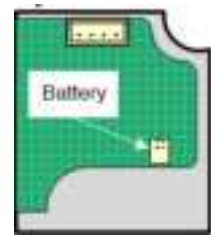
Operation

The Decoder operation is provided from a standard ERT-A2 ALERT2 cannister which is configured as a Base Receiver.

The ERT-A2 is powered internally from a Li-on battery which can be charged via the charging port and plug-pack power supply provided in the kit.

The power switch on the front panel turns off the ERT-A2 and isolates the battery from drawing any further current, i.e. via the USB charging socket.

If you need to change the battery or remove it for whatever reason, please disconnect from the connector behind the stainless-steel bracket inside the ERT-A2 as shown in the diagram above.



Configuration

As the Receive/Decoder is a standard ERT-A2 it can be used as a spare Field station or Repeater if required in an emergency and so may need to be reconfigured from time to time.

To reconfigure the unit back to a Base Receiver, connect to the “configuration” USB B Socket in the case using a standard USB A USB B (Printer) cable (included) and follow the basic configuration requirements as per below.

From a factory defaulted unit select “Unit Config” from the main menu then “Communication”
Configuration Mode = “Integrated Radio Reporting”

Unit Type = “Base Station Rcvr”

Tx Frequency = Configure to match your system.

RX Frequency = Configure to match your system.

Report Format = Generally this would be ALERT Binary which receives both ALERT Binary and ALERT IFLOWS format. If your network operates using ALERT2 protocol, select this from the menu.

Next, navigate back to the main menu and then select “Show/Save configuration”, check its correct then select “Yes” to save.

ERRTS RANGER Software

ELPRO Alert2 Ranger software can be downloaded from the Resources / Knowledgebase section on our web site.

www.elprotech.com

Description

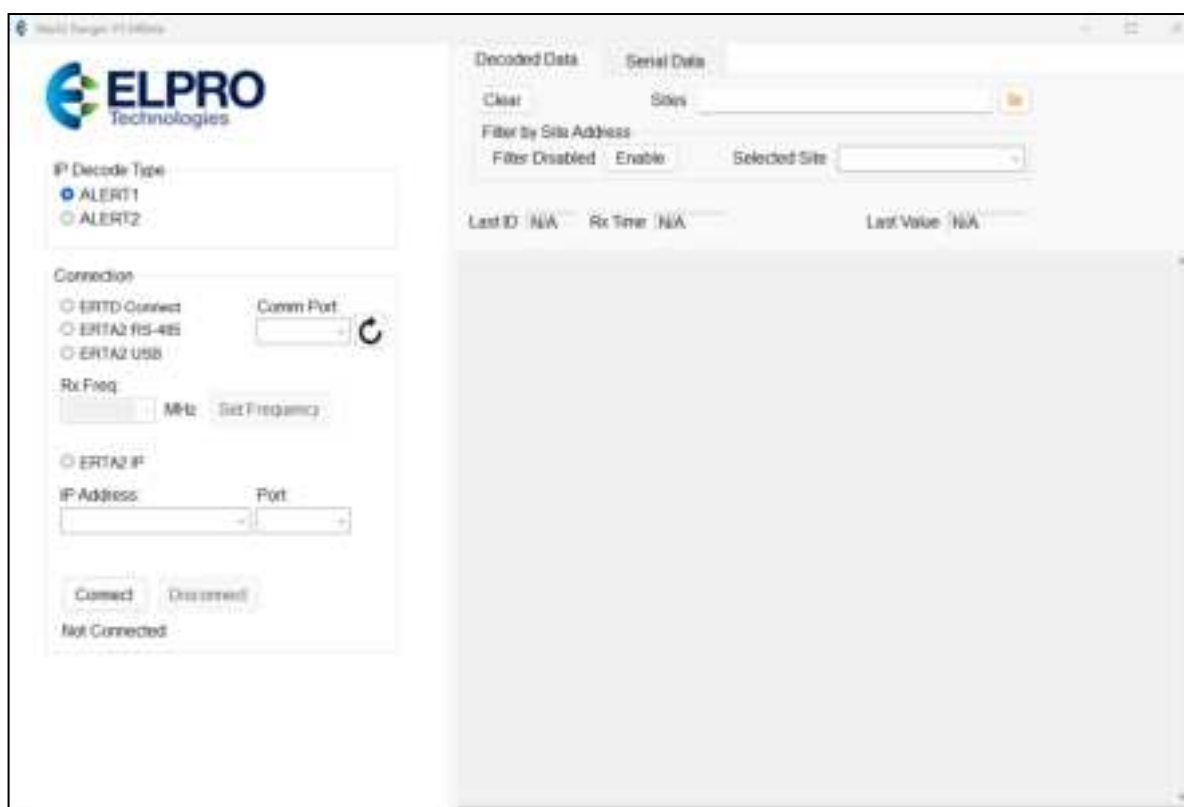
ERRTS Ranger is a Windows Interface/Driver for ALERT and ALERT2 Flood Warning system protocols. This manual applies to the software “Alert2 Ranger V1.04Beta (19-5-23)”.

Connecting the portable computer

A USB A to USB B (Printer) cable is supplied with the ERTK-A2 Field Test Set.

Connect the lead to the USB B socket marked as “Serial Data” on the panel in the Test Set case. Then connect the other end to the serial port of your portable computer.

Download, install and then run the “Ranger” software and you will see a screen like below.



Select the IP Decode Type for your system, i.e. Alert 1 or Alert 2 and the comm port that you are plugged into from the drop-down list. (If you are unsure of the Comm port number, check Windows Device Manager. Press the circular arrow to update the Comm port list.

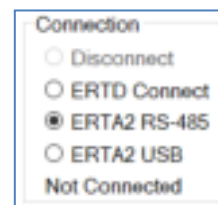
Comm Port

COM8



Connection Options

The ERTK-A2 Field Test Set can be Setup to connect via the following interfaces:



- ERTD Connect - Allows you to connect to the older Elpro Decoder Serial port. This decodes standard ALERT (version 1) protocol from an ELPRO ERTD data decoder.
- ERTA2 RS-485 - Connection to the “Serial Data Out” socket on the connection panel, which will decode either ALERT or ALERT2 (whichever is configured) frames received by the ERT-A2.
- ERTA2 USB - This allows direct connection to the ERT-A2 USB port. This connection is useful to monitor traffic received at a repeater station or a base station where there is no RS485 connection available. **Note** this connection requires ERT-A2 with firmware version 1.7 or newer to operate.

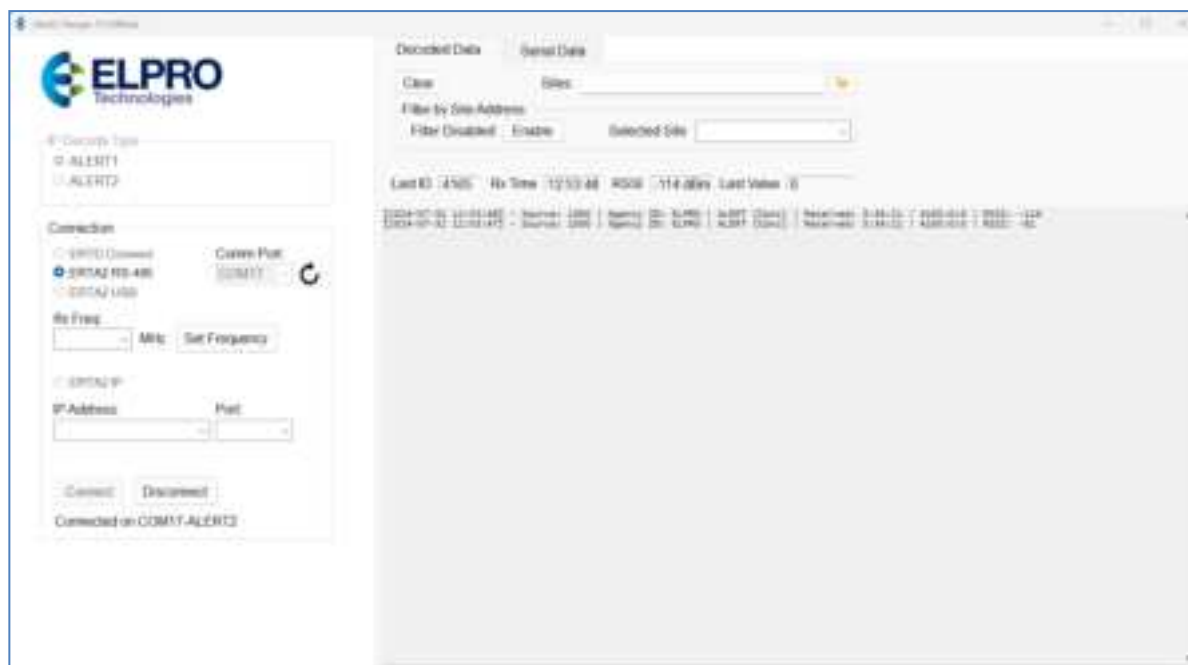
Default for Ranger Decoding with the Test Set is “ERTA2 RS-485”

You do not need to set up any serial parameters on your portable computer as the Ranger software will automatically adjust itself to the correct baud rate, data bits, parity, stop bits and flow control as required.

The Ranger software will now record any ALERT and/or ALERT2 messages it receives and will decode the data appropriately.

Displayed Data Frame – ALERT Concentration format

When the ERT-A2 is configured for ALERT IFLOWS or ALERT Binary mode (ALERT version 1), the data is received in ALERT mode, and forwarded to the Ranger Software as an ALERT2 Concentration frame which holds the data from one or more ALERT messages.



The data from the most recent frame is displayed at the top of the screen and will only display data from a single station ID (refer to section “Filtering Data” below).

The fields here show:

- Last ID:** - The Station ID of the last receive message. For a Concentration Format frame, this is the ALERT (version 1) ID of the last received message.
- Rx Time:** - This is the timestamp recorded at your portable computer when the message was received.
- RSSI:** - This is the received signal strength of the last message.
- Last Value:** - This is the sensor value corresponding to the sensor ID shown in “Last ID”.

More detailed information is shown in the Decoded Data section. The format of the data displayed consists of the following items:

Decoded Data							
[2022-12-22 12:46:45]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:42:59	1002:137:0	1000:96:0	RSSI: -36
[2022-12-22 12:36:45]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:32:59	1000:137:0	1000:96:0	RSSI: -38
[2022-12-22 12:32:46]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:29:01	4444:136:0	RSSI: -62	
[2022-12-22 12:32:41]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:28:56	3333:0:0	RSSI: -62	
[2022-12-22 12:32:36]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:28:51	2222:0:0	RSSI: -61	
[2022-12-22 12:32:31]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:28:46	1111:8:0	RSSI: -62	
[2022-12-22 12:26:44]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:22:59	1004:137:0	1000:96:0	RSSI: -37
[2022-12-22 12:16:44]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:12:59	1004:137:0	1000:96:0	RSSI: -40
[2022-12-22 12:09:42]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:05:57	5:1880:0	1111:260:0	RSSI: -107
[2022-12-22 12:06:44]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 4:02:59	1000:137:0	1000:96:0	RSSI: -38
[2022-12-22 11:56:44]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 3:52:59	1004:137:0	1000:96:0	RSSI: -38
[2022-12-22 11:48:42]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 3:44:57	1234:1880:0	1111:260:0	RSSI: -107
[2022-12-22 11:48:13]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 3:44:28	1000:96:0	RSSI: -47	
[2022-12-22 11:47:37]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 3:43:52	1111:8:0	RSSI: -58	
[2022-12-22 11:47:32]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 3:43:47	1111:3:0	RSSI: -57	
[2022-12-22 11:47:03]	Source: 1000	Agency ID: ELPRO	ALERT (Conc)	Received: 3:43:18	1000:95:0	RSSI: -38	

- [Time Stamp]** - Time the message was received in the Ranger Software.
- Source:** - Source Address of the message. This is the address of the local ERT-A2 unit in the ERTK-A2 Field Test Set.
- Agency ID:** - Configured Agency ID at the ERTK-A2 unit (default value ELPRO)
- ALERT (Conc)** - Frame type indication – This indicates one or more ALERT (version 1) messages inside an ALERT2 concentration frame.
- Received:** - Data Time Stamp (Actual event time Stamp from the local ERT-A2 device).
- Data:** - This is the actual data Sensor ID's, data values and time offset. (Will show multiple values in the data frame). The sensor ID is the ALERT sensor ID of the remote ALERT (version 1) device. The data value is the data sent with the sensor ID, and the time offset is the time (in seconds) that the message was held at the receiver before it was forwarded (This will be zero for a normal base station receiver).
- RSSI:** - Signal level of the received radio message (measured in dBm)

Displayed Data Frame – ALERT2 General Sensor Report format

When the ERT-A2 is configured for ALERT2 format, the data is received by the ERTK-A2 unit in ALERT2 mode and forwarded to the Ranger Software as an ALERT2 general sensor report from the remote station.

Last ID 2009 Rx Time 13:04:18 RSSI -80 dBm Last Value 14

The data from the most recent frame is displayed at the top of the screen. This can be set to only display data from a single station (refer to section “Filtering Data” below).

The fields here show:

- Last ID:** - The Station ID of the last receive message. For an ALERT2 Format frame, this is the ALERT2 ID of the remote sending station.
- Rx Time:** - This is the timestamp recorded at your portable computer when the message was received. This is the same as the [Time Stamp] value in Decoded Data.
- RSSI:** - This is the received signal strength of that message.
- Last Value:** - ALERT2 messages can contain data from multiple sensors. This field shows the sensor ID and value for each of the sensors in the message.

More detailed information is shown in the Decoded Data section. The format of the data displayed data consists of the following items:

Decoded Data

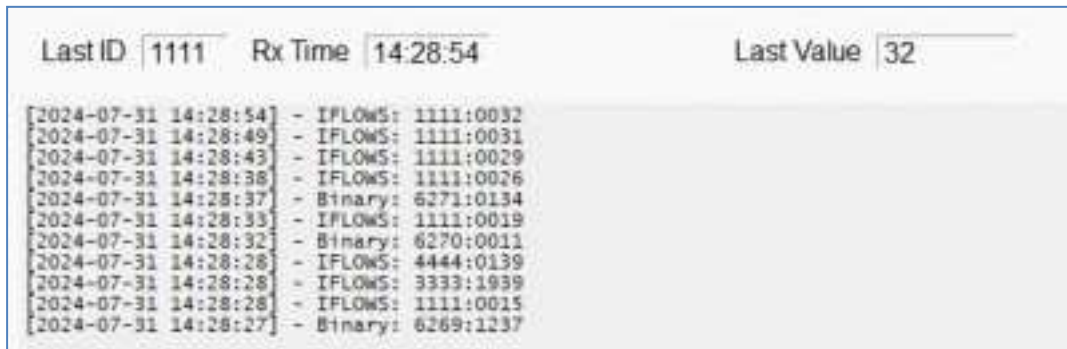
[2022-12-29 12:43:51]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:2:41:40	3:300	RSSI: -95		
[2022-12-29 12:40:34]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:2:58:23	8:137	5:-168	3:295	RSSI: -95
[2022-12-29 12:39:31]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:2:37:20	8:137	5:-168	3:294	RSSI: -95
[2022-12-29 12:36:31]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:2:34:20	8:137	5:-168	3:294	RSSI: -95
[2022-12-29 12:26:31]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:2:24:20	8:137	5:-168	3:294	RSSI: -95
[2022-12-29 12:21:46]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:2:19:35	3:294	RSSI: -97		
[2022-12-29 12:21:31]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:2:19:20	8:137	5:-168	3:291	RSSI: -96
[2022-12-29 12:09:31]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:2:07:20	8:137	5:-168	3:289	RSSI: -95
[2022-12-29 11:59:31]	- Source: 1950	Agency ID: ELPRO	ALERT2: 1111	Sent:1:57:20	8:137	5:-168	3:289	RSSI: -95

- [Time Stamp]** - Time the message was received in the Ranger Software.
- Source:** - Source Address of the message. This is the address of the local ERT-A2 unit in the ERTK-A2 Field Test Set.
- Agency ID:** - Configured Agency ID at the Base station (default value ELPRO)
- ALERT2:** - Frame type indication – This is a single ALERT2 message. The 4-digit Address is the station ID of the remote field station
- Sent:** - Data Time Stamp. For ALERT2 messages, this is the time stamp added at the remote field device.
- Data:** - This is the actual data Sensor ID's and data values. This will show multiple sensor IDs and values in the data frame. The sensor ID is the ALERT2 sensor ID at the remote ALERT2 device. The data value is the data sent with the sensor ID. In the image above, the reports at 12:43:51 and 12:21:46 contain a single data item (ID 3). The other reports contain three data items, IDs 8, 5, and 3.
- RSSI:** - Signal level of the received radio message (measured in dBm)

Connecting to the ERTD Decoder for ALERT messages

You can use the Ranger software to monitor data from a legacy ALERT receiver/decoder (ERTD, ERTE) configuration. Select the correct Comm port, then click “ERTD Connect”

When connected to an ERTD unit, the received data is in the original ALERT (version 1) format.



Last ID	1111	Rx Time	14:28:54	Last Value	32
[2024-07-31 14:28:54]	-	IFLOWS:	1111:0032		
[2024-07-31 14:28:49]	-	IFLOWS:	1111:0031		
[2024-07-31 14:28:43]	-	IFLOWS:	1111:0029		
[2024-07-31 14:28:38]	-	IFLOWS:	1111:0026		
[2024-07-31 14:28:37]	-	Binary:	6271:0134		
[2024-07-31 14:28:33]	-	IFLOWS:	1111:0019		
[2024-07-31 14:28:32]	-	Binary:	6270:0011		
[2024-07-31 14:28:28]	-	IFLOWS:	4444:0139		
[2024-07-31 14:28:28]	-	IFLOWS:	3333:1939		
[2024-07-31 14:28:28]	-	IFLOWS:	1111:0015		
[2024-07-31 14:28:27]	-	Binary:	6269:1237		

The data from the most recent frame is displayed at the top of the screen. This can be set to only display data from a single station (refer to section “Filtering Data” below).

The fields here show:

- Last ID:** - The ALERT ID of the last received message.
- Rx Time:** - This is the timestamp recorded at your portable computer when the message was received.
- Last Value:** - This is the sensor value corresponding to the sensor ID shown in “Last ID”.
- More detailed information is shown in the Decoded Data section. The format of the displayed data consists of the following items:
- [Time Stamp]** - Time the message was received in the Ranger Software.
- Binary:** - Displayed for ALERT Binary format messages
- IFLOWS:** - Displayed for ALERT Enhanced IFLOWS format messages
- ID : VALUE** - The sensor ID and Sensor value from the receive message.

Station Names

Ranger software will support a file with lookup of station names and IDs. This file must be named "Address-Location.txt" and must be placed in the same directory as the ERTA2Ranger executable.

```
; *****
; * ADDRESS LOCATION FILE *
; * ----- *
; *****
; This is an example of the address location file.
; The actual address (ID) must be first, followed by the user name.
; The user name can be any length, but should be kept to 22 characters
;
; The program ignores lines that do not start with a <space>.
;
; <- 22 characters ->
; ALERT ADDRESS      USER      NAME
; -----
; 838                Mingo Ck Rd RN
; 839                Mingo Ck Rd Batt
```

If you need to add entries to the Txt file, make sure the file is saved before loading the Software. Software will only load on startup.

Filtering Data

The ERRTS Ranger software will display all incoming data and display the ID and Values.

You can filter incoming data to only display data from a single sensor at the top of the screen (the main Decoder Data and Serial Data fields will still show all received messages).

Click the Check box marked “Enable” under “Filter by Site Address” to enable filtering. The “Filter by Site Address” will grey out and the text box marked “Selected Site” will show the site name you have selected.

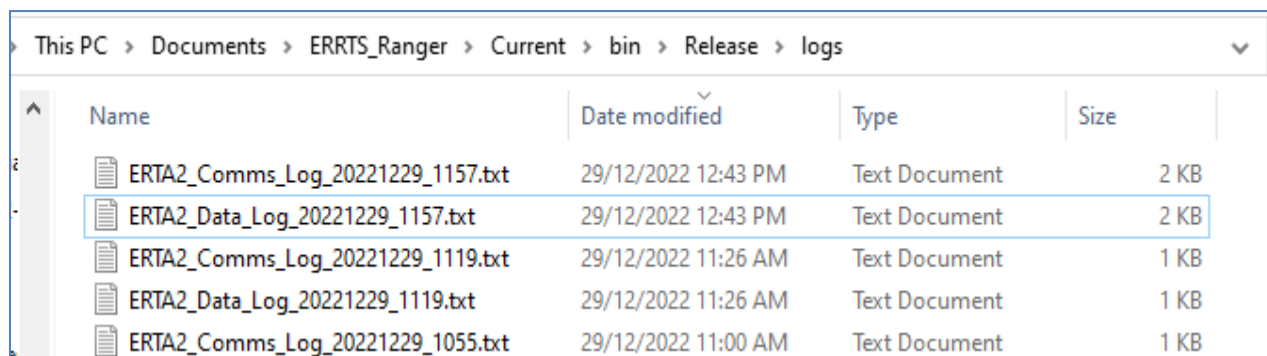
If the filter is disabled the Fields will display the last ID, Time stamp and Last Value in the message list.

The screenshot shows the ERRTS Ranger software interface. At the top, there is a 'Clear' button and a 'Sites' dropdown menu with 'Address-Location.txt' selected. Below this is the 'Filter by Site Address' section, which includes a 'Filter Enabled' checkbox (checked) and a 'Disable' button. To the right of this is a 'Selected Site' dropdown menu with 'Test RAIN (1111)' selected. Below the filtering options, there are three fields: 'Last ID' with the value '1111', 'Rx Time' with the value '14:48:22', and 'Last Value' with the value '36'. At the bottom, there is a list of received messages. The messages are displayed in a table-like format with columns for date/time, ID, and value. The message '2024-07-31 14:48:22 - IFLOWS: 1111:0036' is highlighted in yellow.

Date/Time	ID	Value
2024-07-31 14:48:53	5516:0026	
2024-07-31 14:48:53	5516:0026	
2024-07-31 14:48:22	1111:0036	36
2024-07-31 14:48:17	1111:0034	
2024-07-31 14:48:06	4810:0134	
2024-07-31 14:48:06	4800:1718	
2024-07-31 14:48:06	4801:0023	
2024-07-31 14:48:06	4802:0134	
2024-07-31 14:47:52	4122:0017	
2024-07-31 14:46:53	6776:0021	
2024-07-31 14:46:35	6896:0137	
2024-07-31 14:46:30	6895:0958	
2024-07-31 14:45:32	5514:0138	
2024-07-31 14:45:30	5512:1433	
2024-07-31 14:45:28	5513:0001	
2024-07-31 14:44:54	4102:0004	
2024-07-31 14:44:53	4133:0024	

Data Log Files

The ERRTS Ranger software automatically logs data as well as displaying it on the screen. Each time you connect, it creates two new log files to log the decoded data and raw serial data.



This PC > Documents > ERRTS_Ranger > Current > bin > Release > logs				
Name	Date modified	Type	Size	
ERTA2_Comms_Log_20221229_1157.txt	29/12/2022 12:43 PM	Text Document	2 KB	
ERTA2_Data_Log_20221229_1157.txt	29/12/2022 12:43 PM	Text Document	2 KB	
ERTA2_Comms_Log_20221229_1119.txt	29/12/2022 11:26 AM	Text Document	1 KB	
ERTA2_Data_Log_20221229_1119.txt	29/12/2022 11:26 AM	Text Document	1 KB	
ERTA2_Comms_Log_20221229_1055.txt	29/12/2022 11:00 AM	Text Document	1 KB	

ERTA2_Data_Log_<yyyymmdd_hhmm> logs the decoded output displayed under “Decoded Data”

ERTA2_Comms_Log_<yyyymmdd_hhmm> logs the raw received data displayed under “Serial Data”.

Changing Frequency (Temporarily) via USB-B “Configuration”

The Ranger software allows you to temporarily change the Frequency of the Receiver rather than needing to close the software and have to open some other terminal software, etc.

Disconnect the USB cable from “Serial out” and plug into the “Configuration” USB Socket on the front panel and then use Windows Device Manager to confirm which Comm port to choose. It may have changed when you change to the other USB socket.

Change the appropriate Comm port under “Connection” and click “ERTA2 USB”.

Press “connect”



You will be prompted for the **Technician Password**. This is not the normal Engineers password that you might use for Configuration, etc.

Select “Use Default” if you have not changed the password from the factory setting. If you have changed this then you will need to enter the new password.

When you connect you will notice a Frequency will show in the RX Freq text box.

You can change the Receive frequency to what you require and press “Set Frequency.”

You will not see any feedback to indicate that it has changed as it is temporary change and if you press the “disconnect” it will revert to its previous setting.

Note: Take care to Disconnect from repeaters or base stations after you have completed your test. If you change frequency and unplug without first selecting “Disconnect”, the receive frequency will remain at the value you have set. It will eventually default back to its original, but it may take a couple of minutes for this to happen. Far better to make sure you disconnect first.

If you forget to disconnect, you can restore the frequency by:

- Reconnecting the USB cable, connect to ERTA2 USB, then select Disconnect; or
- Restarting the module (RESET button); or
- Setting the frequency back to the original value through the configuration menu.

Support

To speak with our Technical support Team, please contact us on:

Web: www.elprotech.com

Email: support@elprotech.com

Phone: +61 7 3352 8624

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