

ERT-A2 Basic ALERTv1 Configuration

PURPOSE

The purpose of this document is to give some basic setup instructions for the ELPRO ERT-A2 cannister operating in ALERT v1 Mode.

MATERIALS USED

PC with USB to Serial adaptor or alternatively a comms port

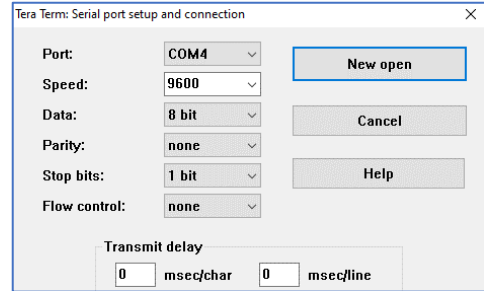
Terminal application (Putty, Tera Term, etc)

1 x ERT-A2

Power supplies for ERT-A2 units

APPLICATION

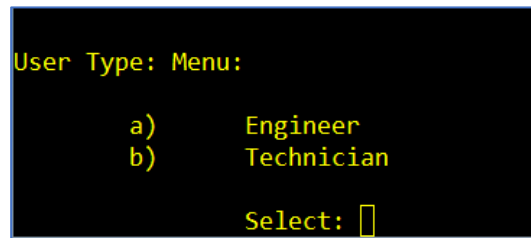
Open the Terminal application and setup serial communications on the Com port for 9600, 8, N, 1.



Connect to the cannister using a USB cable then

Press <Enter> to get the terminal menu.

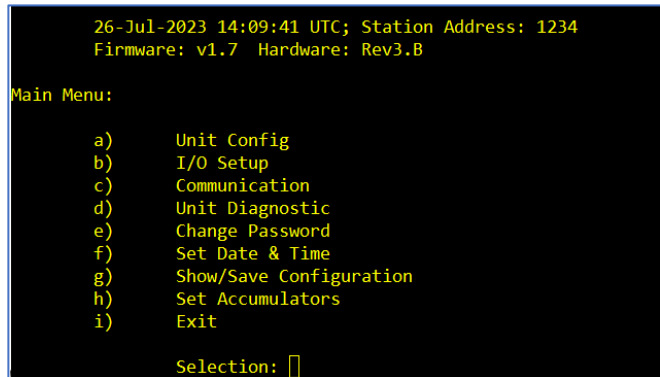
You should see the login as shown to the right.



Type "a" to get into the Main Menu with Engineering Access (Full)

Default Password is "Elproeng"

From here you will see the Main Menu as well as some basic information at the cannister at the top of the screen, i.e., Station ID, Firmware and Hardware Versions.



Select "a)" to enter the Unit Config Menu

Basic Alert1 setup

You will need to setup basic communications parameters, select “c)” to view the Communication setup, then select the appropriate letter that corresponds to the setting.

- a) **Communication:** Allows you to select the Communication Mode, select “Integrated Radio”.
- b) **Unit Type:** Allows you to select the type of unit, i.e., Field station, Repeater, Base Station.
- c)&d) **TX & RX frequency:** This allows you to setup the TX and RX frequency, match this to your configured Receive Frequency.
- e) **TX Power:** Sets up the Transmit power level, will allow 7dB (5mW) to 40dB (10Watts), Typically will be 37dB (5Watts).
- f) **Report Format:** this is where you select what report data you wish to Receive. ALERT v2 protocol, ALERT v1 Binary or Alert 1 IFlows.

Press <Enter> a few times to get back to the main Menu and select “g) Show/Save Config” This will allow you to review your setup so far and save any changes. This is a good idea because if the configuration takes too long the Menu can timeout and you will lose any unsaved setting and have to start again.

```

=====
Communication Mode: Integrated Radio Reporting
Unit Type: Field Station      Station Address: 1234
Tx Frequency MHz: 151.500000  Tx Power: 5W
Report Format: ALERT Binary
GPS Update: 184              GPS Maximum On: 2
Update Time: 180min          Paralysis Time: 10sec
Analog Sample Time: 1min     Analog Warmup Time: 5sec
Data Log Format: ALERT2 ASCII

External Inputs:
      DI3      AI1
Mode  Pulse    4-20mA
Raw   292      -0.043 mA
ID    1234     1235
Format U-2     U-2
Scale 1        500
Offset 0mm     0(0mm)
Sens   1mm     1(10mm)
Value  292mm   0mm

Internal Status:
      Battery
ID    1236
Format U-2
Value 12.6 V

SDI-12 Operating Mode: Disabled
Save Current Config? (y/n):[]
    
```

Next, select option **a) Unit Config** from the main menu then the options below,

```
Unit Config Menu:

a)    Station Address
b)    Update Time
c)    Paralysis Time
d)    Data Log Format
e)    Battery Type
f)    ALERT2 I/O Quick Setup
g)    ALERT(version 1) I/O Quick Setup
h)    Restore Default Configuration

Select: 
```

- a) **Station Address:** This option will configure the Base ID for the cannister. Generally, the Station Address sets up the Base ID as the Rain count, ID+1 is the Analog and the ID+2 was the Battery). These days the ID's get reused and may not be in this format or even sequential. If this is the case, you can configure the Base ID as the Rainfall ID, then manually adjust the rest of the IDs from the "I/O Setup" menu.
- b) **Update time:** Sets up the default time the cannister will update, can be any time between 1 and 100000 minutes (69.4 days). The default is 180 mins.
- c) **Paralysis Time:** (Time to hold off before another transmission can occur), can be any time between 0 and 600 Seconds. The default is 10sec.
- d) **Data log File:** This is the event Logging format that all event are saved within the ERT-A2 for USB diagnostic download. The default is ALERT ASCCI, however I believe CSbV on Change is more useful for Alert1 data.
- e) **Battery Type:** choose which battery is being used, either, LiFe of Lead Acid.
- f) **ALERT2 I/O Quick Setup:** sets up appropriate I/O for an Alert 2 Cannister.
- g) **Alert (Version 1) I/O Quick Setup:** sets up appropriate I/O for an Alert1 Cannister, i.e. standard with ID's (Rain, River (Analog) & Battery).
 - Unit selection, either Metric or Imperial.
 - Rain will be the "Station ID" (configured above).
 - River (Analog) will be Analog #1 with an ID of "Station ID" + 1.
 - Setup River Sensor, either Analog (4-20mA), Shaft Encoder Incremental or Quadrature.
 - Then an analog range, Sample time, warmup time, Increment to send and an offset if needed.
 - Battery will be "Station ID" + 2.

If you are not using some of the inputs, i.e. just a Rainfall site and no analog, just step through the defaults and then manually disable or adjust any configuration parameters from the IO Setup menu.

Note: This will overwrite any previous configurations and should only be used for the initial setup.

Again press <Enter> a few times to go back to the Main Menu and select “**g) Show/Save Config**” This will allow you to again review your setup and save any changes, I would recommend doing this regularly. Note: Only the I/O that is used is configured is shown.

```

Communication Mode: Integrated Radio Reporting
Unit Type: Field Station      Station Address: 1234
Tx Frequency MHz: 151.500000  Tx Power: 5W
Report Format: ALERT Binary
GPS Update: 184              GPS Maximum On: 2
Update Time: 180min          Paralysis Time: 10sec
Analog Sample Time: 1min     Analog Warmup Time: 5sec
Data Log Format: CSV on Change

External Inputs:
      DI3      AI1
Mode   Pulse   4-20mA
Raw    292     -0.043 mA
ID     1234    1235
Format U-2     U-2
Scale  1       500
Offset 0mm     0(0mm)
Sens   1mm     1(10mm)
Value  292mm   0mm

Internal Status:
      Battery
ID     1236
Format U-2
Value  12.6 V

SDI-12 Operating Mode: Disabled

Press any key..

```

I/O Setup Menu

Selecting “**b) I/O setup**”: from the main menu will open the I/O Setup Menu, where we can disable, fine tune, and configure any of the I/O parameters below.

Generally, the common sensors used for ALERT1 would be Rain, Analog, and Battery. The Rain is a pulsed input, and its default is “Digital 3”. The Analog is a 4-20mA level, and its default is “Analog 1” and lastly Battery which shows the Battery voltage (as an analog value). Selecting any of these options from the I/O Setup Menu will display a sub menu where we can adjust all or some of the parameters below.

```
I/O Setup Menu:

a) Digital 1
b) Digital 2
c) Digital 3
d) Digital 4
e) Analog 1
f) Analog 2
g) Battery Voltage
h) Supply Voltage
i) RSSI
j) Internal Temp
k) Status Sensor
l) Input mode Din1/Din2
m) SDI-12 Device config
n) Analog Sampling

Select: [ ]
```

```
AT1
Mode 4-20mA
ID 1235
Format U-2
Scale 500
Offset 0(0mm)
Sens 1(10mm)
Display 10.00mm
Value 0mm

Analog 1 Menu:

a) Sensor ID '-' to disable
b) Report Format
c) Span / Range
d) Zero / Offset
e) Display Units
f) Display Scaling
g) Report Sensitivity

Select: [ ]
```

- a) **Sensor ID:** This is where we can change the ID (enter a value of “-“ will disable).
- b) **Report format:** Allows us to change the format from its default to the required format (can vary depending on the I/O). Generally, ALERT2 will be S-3 (Signed 3-byte value), ALERT1 will be U-2 (Unsigned 2 byte) and there is an option to manually configure for either Signed or Unsigned Integer or Floating Point and a data length of 1-4 bytes. As this application note is setting up for ALERT1, the default ALERT1 Quick Setup above should be used which would have made sure the I/O formats were U-2. Generally, the report format will only need to be changed if you need to configure some special formatting or changing to Alert2.
- c) **Scaling (Rain), Span/Range (River Analog):** This option allows you to adjust the Scale/Span.
 - If it’s a rain input, this would be the number of tips that will register an increment on the ID. Default is 1 however if you have a different Scale Rain Gauge you may want to adjust this accordingly
 - If it’s a River (Analog) this will be a scaled value calculated from the full range of the Transducer, divided by the increment you need to report i.e. 5000mm / 10mm increments would be a scale of 500. Because the Alert protocol displays a maximum of 11-bit values (0-2048) the value received would be shown as 0 - 500 counts which represents 0-5000mm.
- d) **Zero / Offset:** is used this will offset the zero point of the analog input. If you needed to offset the level to AHD (Australian Height Data), this is where you would enter the offset level. E.g. if the above “Span / Range” scale was used with an offset of zero the maximum value received for a 20mA analog level would be 500, however if we were to configure an offset of say “1000” then the same 20mA level would show as 1500.
- e) **Display Units:** This is what units it will display in the menu, for diagnostics, e.g. mm.

- f) **Display Scaling:** Multiplier used to scale the sensor value to engineering units. i.e. configure this to the increment value you would like to send, e.g. 10mm.
- g) **Report Sensitivity:** Number of increments before a Change of State (CoS) event is generated. Default is 10, so you may need to change to 1 if you wish to send every tip of the Rain Gauge.

A typical analog transducer configuration would be something like below.

If you had a 10m transducer and wanted it to report every 20mm change in level. Setup the analog “Span/Range” for 500 (which is the total transducer span of 10000m / 20mm increments), set the “Zero/Offset” to 0, “Display Scaling” to 20mm and the “Report Sensitivity” to 1 increment. This will display on the ERT-A2 menu a count of 10000 for a full-scale analog (20mA) and 5000 for a half scale analog (12mA), however at the receiving end it will display a count of 1000 for a full-scale analog (20mA) and 500 for a half scale analog (12mA), this is because of the ALERT v1 protocol only supports a maximum of 11bits.

Step back to the “Main Menu” and select “g) Show/Save Config” This will allow you to review your setup and save any changes that have been made.

Other Useful Menu options

Main Menu

- d) **Diagnostics** is the diagnostic Menu and has lots of options to help diagnose and test the cannister, the main ones are,
 - a) **Show Internal I/O:** Shows a scrolling display of the Physical I/O, useful for testing I/o triggers and analog values.
 - b) **Show RSSI List:** Shows Other Station that it can hear and when it was last heard. Mainly used when configured as a Repeater or a Base Station.
 - c) **Diagnose SDI12 queries and diagnostics:**
 - d) **Show Internal I/O:** Shows the status of the internal I/O, i.e. Battery, Supply, RSSI and Temp as well as an Internal and a Radio Status Flag.
 - e) **Force Update Message:** This forces a Transmission to be sent, handy to make sure the change gets sent immediately rather than have to wait for an update.
 - f) **Show Firmware Versions:** Shows the current Host, Bootloader and Radio firmware Version.
 - l)&m) **Calibrate Analog Input:** Allows you to calibrate the analogs by entering 4 & 20mA and letting the processor sample.
 - p) **Enable Debug console:** Will output all raw communication and Debug information to be sent to the serial console.
 - s) **Tone Reversals:** Turns on the transmitter, to check, Power level, antenna VSWR and Battery loading.

Amendment Register:

Issue No.	Date	Details of Amendment
1.0	05/01/20	Draft Issue
1.1	21/07/22	Review/reword configuration processes.
1.2	29/8/22	Minor changes
1.3	20/06/23	Changes For V1.8 Firmware