

CONNECTING TO A TRAMANCO ELECTRONIC SCALE

Introduction

This application note discusses the connection of a Senquip ORB-X1-W to a Tramanco CHEK-WAY® Eliminator series of electronic on-board scales and weighbridges.

Connecting an ORB to a CHEK-WAY® electronic scale will allow truck weight data to be delivered to a user server or SCADA system anywhere in the world.

Hardware Interconnect

The ORB-X1-W has an integrated serial port that can interface to the CHEK-WAY® RS485 data output. The ORB can be powered directly from the 12V or 24V available on the truck on which the CHEK-WAY® is installed.

Pins 1 and 2 of the ORB should be connected to power and ground. The power in this case is derived directly from the vehicle battery and is likely to be 12V or 24V. It is recommended that a 1A fuse be inserted between the battery and power connection of the ORB. The fuse protects the battery in the event that the ORB fails or the positive wire comes loose.

The RS485 connection is made by connecting RS485A on the ORB to RS485A on the Tramanco weighing system. Likewise, RS485B on the ORB is connected to RS485B on the weighing system. There may be other systems connected to the RS485 wires. This will not affect the operation of the ORB. Note that the ORB has an optional RS485 line-termination-resistor that can be enabled if required.

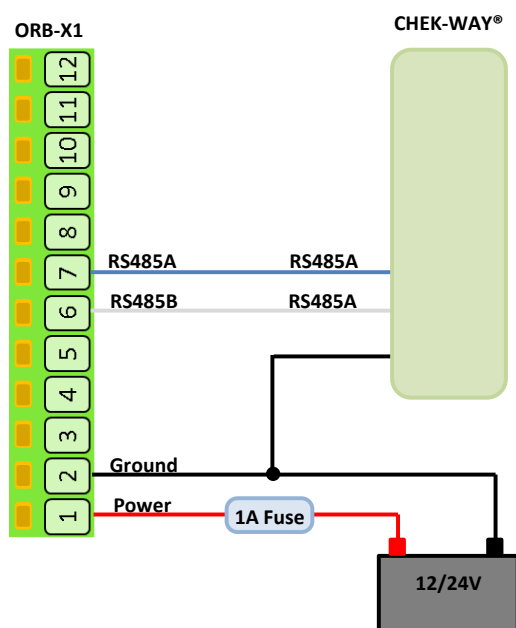


Figure 1 - Connecting an ORB-X1 to a Tramanco Electronic Scale

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ORB Configuration

If you are configuring the ORB for the first time, use a phone, tablet or laptop to access the ORB’s integrated webserver. To activate the webserver, press the setup key on the ORB for 2 seconds and then connect to the ORB’s Wi-Fi on your phone, tablet or laptop. Passwords for the ORB’s Wi-Fi and webserver can be found on a tear-off sticker under the lid of the ORB. For further details on how to access the webserver, please see the “ORB-X1 User Guide”. If the ORB is already available on the Senquip Portal, simply login to the Portal and make the required changes remotely.

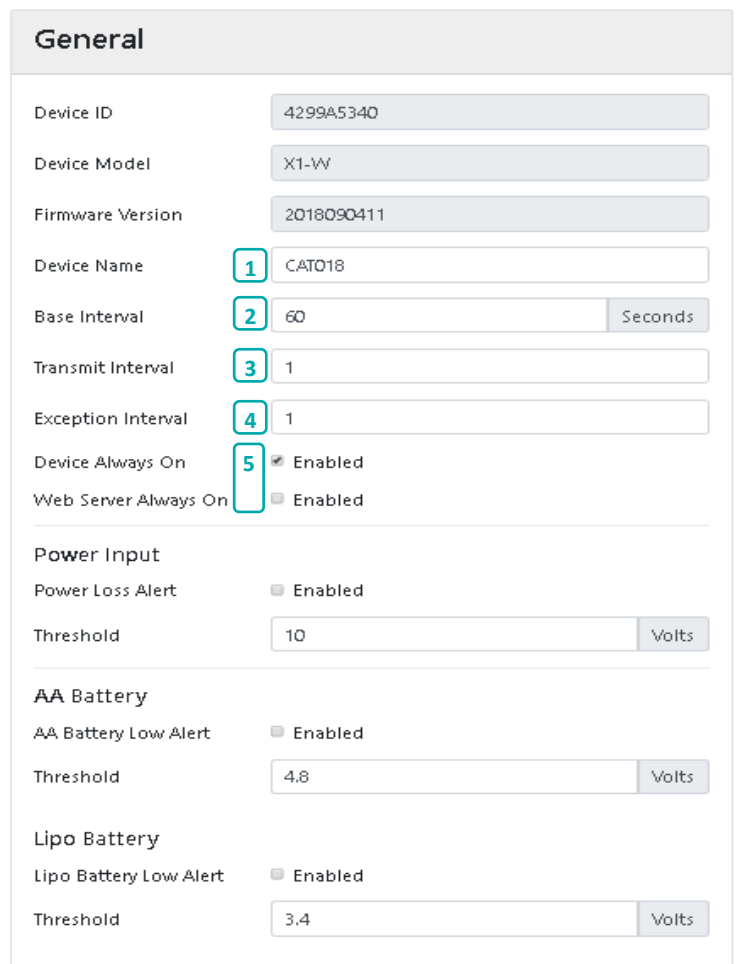
In this application, the end user has requested a weight update every 1 minute that is to be sent to a UDP server via Wi-Fi. For further detail on configuring the ORB to send data to a UDP server, see the “ORB-X1 User Guide”.

Note that only settings used in connecting the ORB to the weighing system are discussed in this application note.

General Setup

For general setup, use the **General** tab on the ORB webserver. Remember to save when complete.

1. Give the ORB a name that is meaningful to the user, in this case, the vehicle registration, “CAT018.”
2. We see from the CHEK-WAY® manual that weight data is sent once every second. In this application, a measurement is required once every minute. By setting the Base Interval to 60 seconds, the ORB can be made to stay sleeping and wake once a minute to look for a serial message.
3. Set the Transmit Interval to 1 so that the received serial message will be sent each time one is received.
4. There are no warnings or alarms used in this application that require faster updates be sent and so the Exception Interval is set to be the same as the transit interval.
5. By turning on Device Always On and Web Server Always On, the ORB will remain awake and the webserver will be accessible on the local WiFi network at all times. This



General	
Device ID	4299A5340
Device Model	X1-W
Firmware Version	2018090411
Device Name	1 CAT018
Base Interval	2 60 Seconds
Transmit Interval	3 1
Exception Interval	4 1
Device Always On	5 <input checked="" type="checkbox"/> Enabled
Web Server Always On	<input type="checkbox"/> Enabled
Power Input	
Power Loss Alert	<input type="checkbox"/> Enabled
Threshold	10 Volts
AA Battery	
AA Battery Low Alert	<input type="checkbox"/> Enabled
Threshold	4.8 Volts
Lipo Battery	
Lipo Battery Low Alert	<input type="checkbox"/> Enabled
Threshold	3.4 Volts

Figure 2 - General Setup

is not necessary in this application but is handy if you are operating over a closed Wi-Fi network and the ORB does not have access to the internet and therefore the Senquip Portal.

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Serial Setup

The ORB is connected to the Tramanco weighing system through the serial port. For serial port setup, use the **External** tab on the ORB webpage and select the serial peripheral.

Example CHEK-WAY® message:

```
CWGS,A91321,+23600,B91332,+19870,C91343,%21940,AG,90010,+65410,30112015,025735,-27.257045,153.018981,0879,1834,F5,DDD,067,054,068,052,3007,0287<CR><LF>
```

For details of the CHEK-WAY® message, please consult the relevant Tramanco manual.

1. Give the Serial data a meaningful name; in this case “Weight”.
2. Serial data is to be sent every time the ORB wakes up and so the Serial Interval is set to 1.
3. According to the CHEK-WAY® manual, the weighing system uses RS485 communication.
4. In this particular install, the distance between the ORB and the CHEK-WAY® scale is less than 1 metre and so does not require RS485 termination resistors be used. In applications where long cable lengths are used or in noisy environments, turn the termination resistor on.
5. In this application, we are waiting for messages to arrive from the CHEK-WAY® system and are forwarding them once received. Use CAPTURE mode to receive and forward messages.
6. According to the CHEK-WAY® manual, the weighing system uses 9600 8N1 communication.

Serial 1

Name	1	Weight
Interval	2	1
Type	3	<input type="radio"/> RS232 <input checked="" type="radio"/> RS485
Termination Resistor	4	<input type="checkbox"/> Enabled
Mode	5	<input checked="" type="radio"/> Capture <input type="radio"/> Modbus <input type="radio"/> Data Output
Baud Rate	6	9600
Settings		8N1
Max Time	7	3
Max Chars	8	200
Capture		
Start String	9	CWGS
End String	10	\n
Request String		Request String
Alert on Capture		<input type="checkbox"/> Enabled

Figure 3 - Serial Settings

7. According to the CHEK-WAY® manual, a weight message will be sent every second. If no message is received after 3 seconds, the ORB will stop listening as something must be wrong. The ORB will return to sleep and try again in 1 minute when it wakes up again.
8. If more than 200 characters are received, something is wrong; the ORB will terminate listening and send the message.

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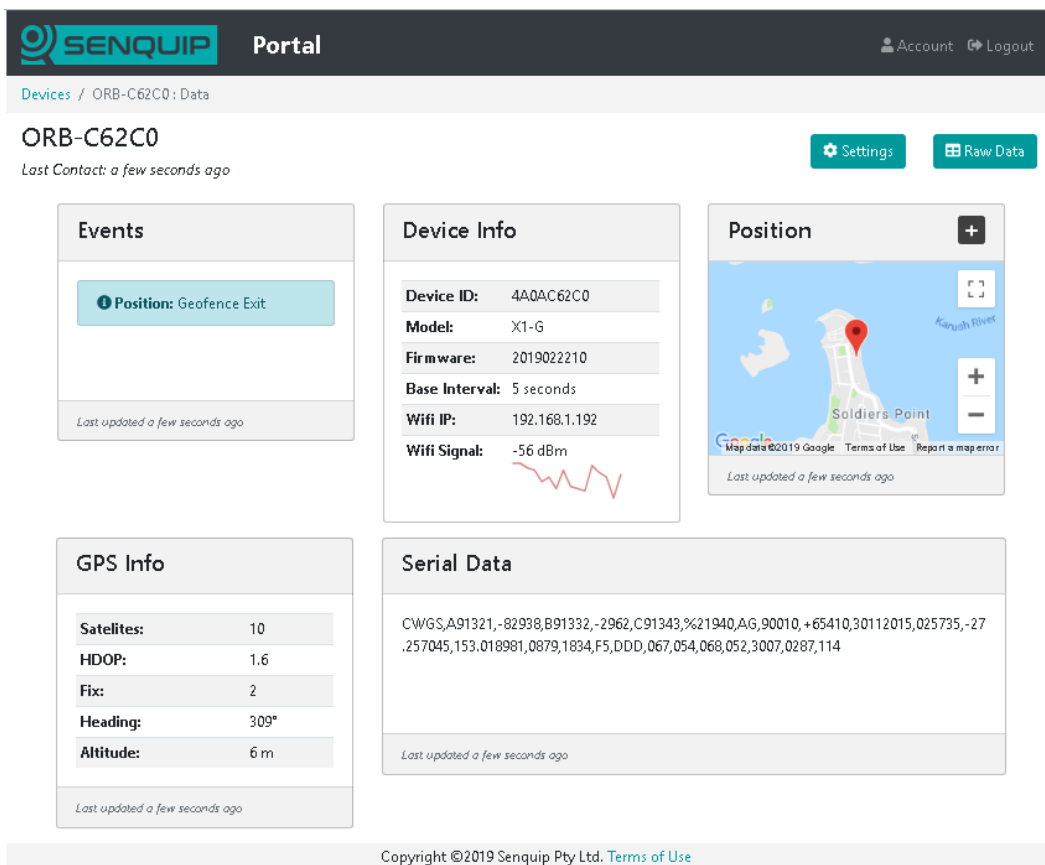
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9. All messages start with CWGS and so when the ORB wakes, it will look for CWGS before starting to capture a message.
10. All messages end with a carriage-return and line-feed and so the ORB will stop capturing data when it sees these values. The CWGS, carriage-return and line-feed as well as everything between will be sent to the server.

Access to the Serial Data on the Senquip Portal

The serial data that is being sent from the Tramanco weighing system can be viewed in various ways:

1. Login the ORB's webserver on your local network and view the real-time serial data being sent.
2. Login to the Senquip Portal (portal.senquip.com) and view the real-time serial data and history or alternately download the data in spreadsheet format using the "Raw Data" tab.



The screenshot shows the Senquip Portal interface for device ORB-C62C0. The page has a dark header with the Senquip logo and 'Portal' text, along with 'Account' and 'Logout' links. Below the header, the breadcrumb 'Devices / ORB-C62C0 : Data' is visible. The main content area features a title 'ORB-C62C0' and a 'Last Contact: a few seconds ago' message. There are two buttons: 'Settings' and 'Raw Data'. The data is presented in several panels:

- Events:** Shows a single event: 'Position: Geofence Exit'. It is updated 'a few seconds ago'.
- Device Info:** Lists device details: Device ID: 4A0AC62C0, Model: X1-G, Firmware: 2019022210, Base Interval: 5 seconds, Wifi IP: 192.168.1.192, and Wifi Signal: -56 dBm. A small signal strength graph is shown below.
- Position:** Displays a map of the area around Soldiers Point, with a red location pin. It is updated 'a few seconds ago'.
- GPS Info:** Shows GPS status: Satellites: 10, HDOP: 1.6, Fix: 2, Heading: 309°, and Altitude: 6 m. It is updated 'a few seconds ago'.
- Serial Data:** Displays a raw data message: 'CWGS,A91321,-82938,B91332,-2962,C91343,%21940,AG,90010,+65410,30112015,025735,-27.257045,153.018981,0879,1834,F5,DDD,067,054,068,052,3007,0287,114'. It is updated 'a few seconds ago'.

At the bottom of the page, there is a copyright notice: 'Copyright ©2019 Senquip Pty Ltd. Terms of Use'.

Figure 4 - Viewing Serial Data on the Senquip Portal

3. Configure the ORB to send the data to a UDP, HTTP or MQTT server. In this case, the data will arrive on the remote server in in JSON format. In the example below, the ORB device ID is 4A0AC62C0 and the serial data is the example message given earlier:

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```
{“deviceid”:"4A0AC62C0”,“serial1”:"CWGS,A91321,+23600,B91332,+19870,C91343,%21940,AG,90010,+65410,30112015,025735,-27.257045,153.018981,0879,1834,F5,DDD,067,054,068,052,3007,0287\r\n”}
```

4. Send the measured data to a SCADA system using an MQTT or other protocol available on the ORB.

Conclusion

The physical connection and setup required to connect a Tramanco CHEK-WAY® Eliminator series of electronic scale to the ORB is quick and simple. Once connected, the weight data provided by the Tramanco weighing system can be viewed anywhere in the world on the internet or on a company server.