Test protocol and report KUWAIT OneSource/Weatherdock

Figure 1: Kuwait Main Centre

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1 Executive Summary:

The test installation was made in a very professional way. Thanks to the support of OneSource. The receiving station was equipped with high end devices and the result is a tremendous good reception of AIS Signals all over the Persian Gulf. (Until down to Dubai!)

The transmitter range was during the first tests at about 60nm, which is already very good. Probably only a second receiver station might be needed. Also, it is to be questioned whether Sat locating is necessary.

Further tests to be done.

2 Test background

Background for the test is the following.
A system consisting of a receiver with antenna and 3 transmitters to be installed in Kuwait, as Kuwait will tender the transmitters for small fishing vessels. The intention is that OneSource/Mr. Eisa Bahman will demonstrate to the Authorities the working system.
Also a possibility could be to install the transmitters and receivers on behalf of OneSource and OneSource is leasing out the system to the Authorities.

Nevertheless Weatherdock and OneSource want to convince the Authorities about the high technical functionality of the vmsTRACK System of Weatherdock.

For all the installation and installing instruction was given to Service from OneSource, Fakhri.

3 Test target

To achieve very good availability of the vmsTRACK transmissions and a high range.

4 Test conditions

4.1 Receiver Site

The receiver will be installed together with a Diamond F22 Antenna at the Bahman Building in Kuwait.
The building is ideal as it is the highest building at that site and so it has got a good view to the sea.

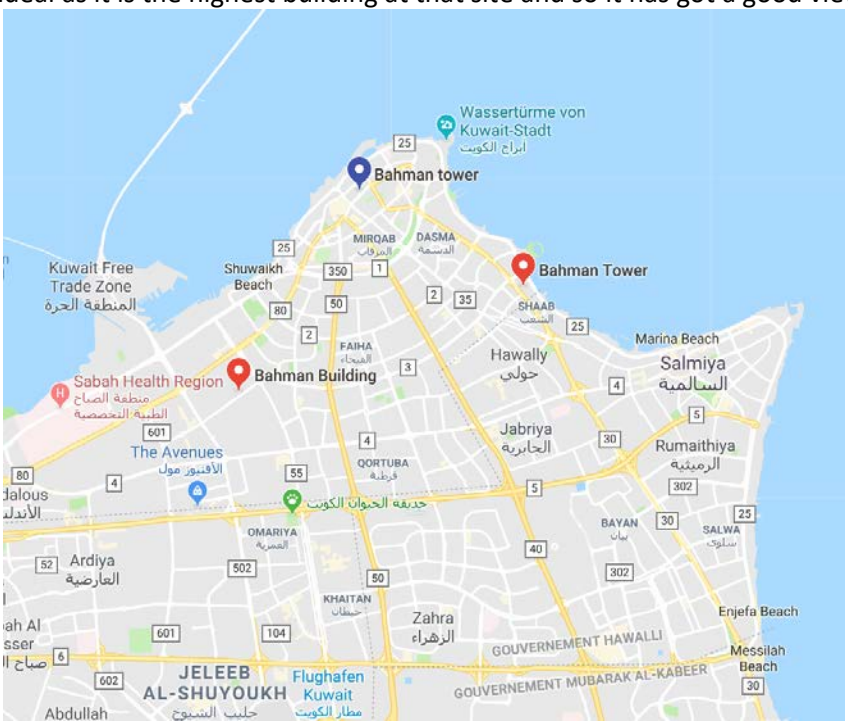

Figure 2: Location of the Bahman Tower in Kuwait

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Figure 3: Bahman tower in Kuwait, picture

The Building has got 37 floors and 5 Executive above, so total 42 floors.
We made the installation on the top of the 42nd floor. The antenna was installed on a tripod and the tripod was secured with some bricks.
The view from the top was spectacular, but the heat was simply “killing”.
50°C in the shadow.

Figure 4: Car was parked in the shadow under a roof

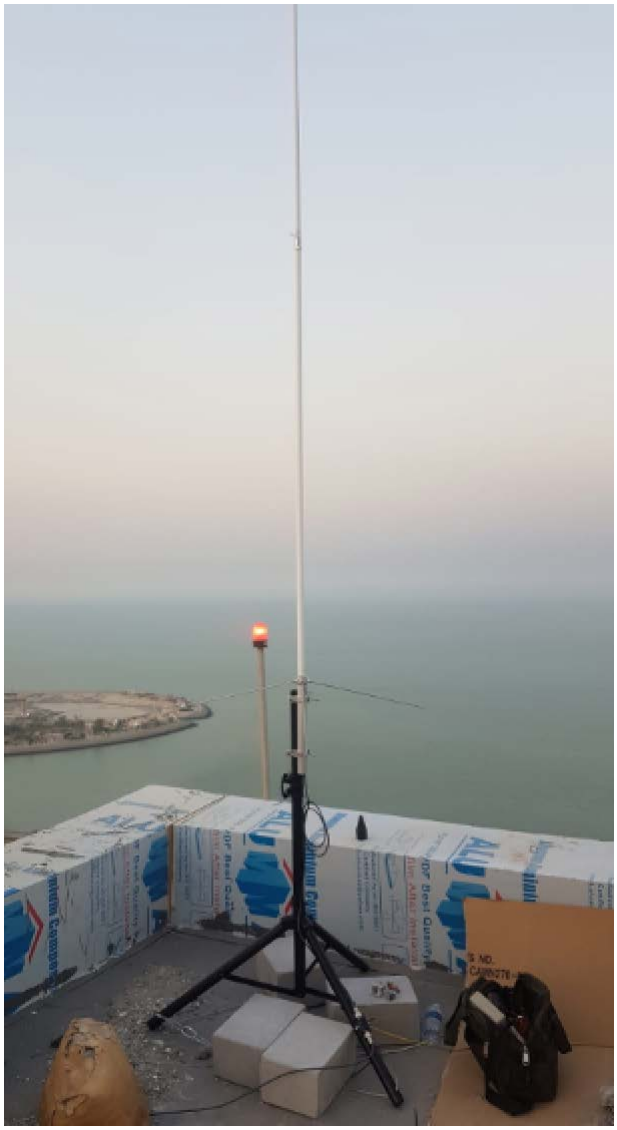

Figure 5: 6 dB gain Antenna on the roof with Flash protector and Low Noise Amplifier.

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Figure 6: Receiver installation (Way of mounting will be improved)

Figure 7: Work on the roof

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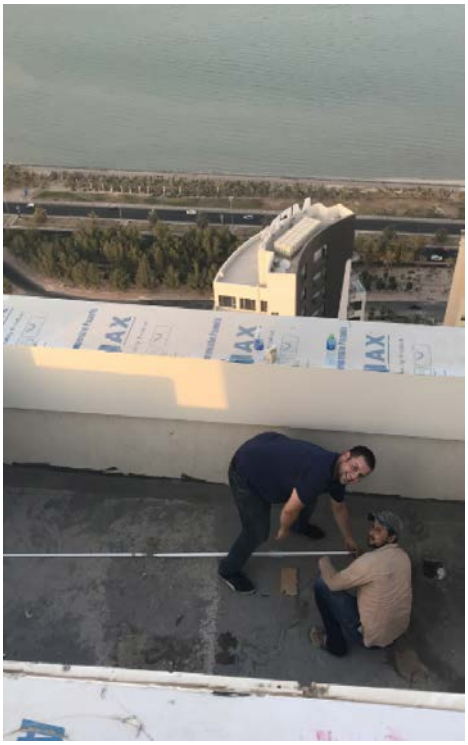

Figure 8: Installing Cables and Receiver easyRX2S-LAN

Figure 9: Done at about 21:00 and enjoying spectacular view

4.2 Vessel

In total 3 units were installed. One on a typical fishing vessel, about 20m long, two on small pleasure boats which can be rented.

4.2.1 Fishing vessel

The fishing boat is located in the fishing port of Al Ahmadi, which is about 37km from the Antenna. The 37km are over land with a lot of buildings.

Figure 10: Port Al Ahmadi, typical fishing vessel

Figure 11: First position where unit was mounted

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Figure 12: According Captains order we had to move the unit

Figure 13: Unit close to the generator, not an ideal place

The unit was at the beginning mounted in the middle of the vessel, more or less above the small captains steering cabin. But, the captain did not like the position and so the solar cell with the unit was moved to the back of the vessel. In our opinion this is not a perfect place, as a generator is very close to the transmitter and it could generate not only current, but also interferences.
27th August about 15:30 local time installation was finished (and we too!)

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4.2.2 Pleasure boat

Figure 14: Pleasure boat installation

Figure 15: Pleasure boat installation details

4.3 Date/time

Tests were made from the 26th August until the 29th August 2019 in Kuwait City.

4.3.1 Weather

The Weather conditions were high temperatures with low humidity:

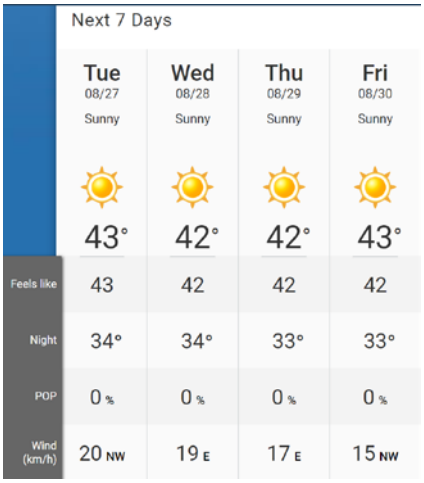

Figure 16: Weather during the tests

5 Equipment used

5.1 easyRX2S-LAN

There was a standard receiver from Weatherdock the easyRX2S-LAN, Serial Nr.: 15666.

Figure 17: easyRX2s-LAN from Weatherdock AG, Germany

5.2 High end Antenna

The antenna was fine-tuned/matched in the Lab of Weatherdock for the AIS frequency of 161Mhz. The antenna has got a gain of about 6dB.
As cable to connect the antenna there was also a cable used with a low “AIS” attenuation, which has an attenuation 45% less than a normal RG58 radio frequency cable.

5.3 Low Noise amplifier, Weatherdock Product Nr. A184

This is a specially made product of Weatherdock to amplify the radio reception by about 20dB, it works together with the specially designed DC-Block from Weatherdock, (A185)

5.4 Cable

As cable to connect the antenna there was also a cable used with a low “AIS” attenuation, which has an attenuation 45% less than a normal RG58 radio frequency cable.

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5.5 vmsTRACK-PRO

There were used 3 units, vmsTRACK-PRO with Bluetooth.
The settings of the units were 30s reporting rate close to the coast, 1min on sea. Tamper functionality activated, switching off in the socket not possible. Standard AIS frequencies, no encryption.

5.6 Software

As Software there was used the MDA Software from Elektroniklab as “offline” desktop solution and the “cloud” software vmsTRACK from Elektroniklab, too.

5.6.1 vmsTRACK website

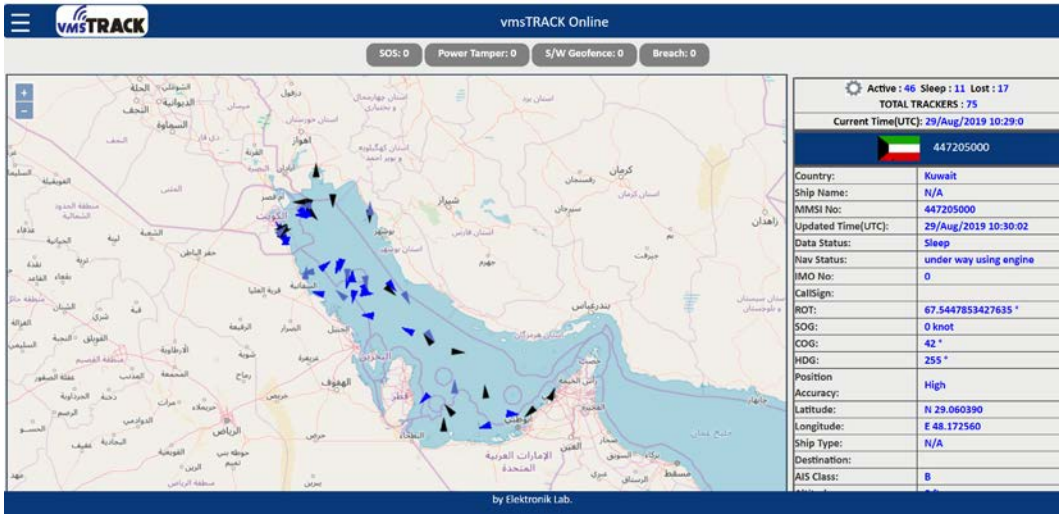

Figure 18: Screenshot of the "cloud" software

5.6.2 MDA software (offline)

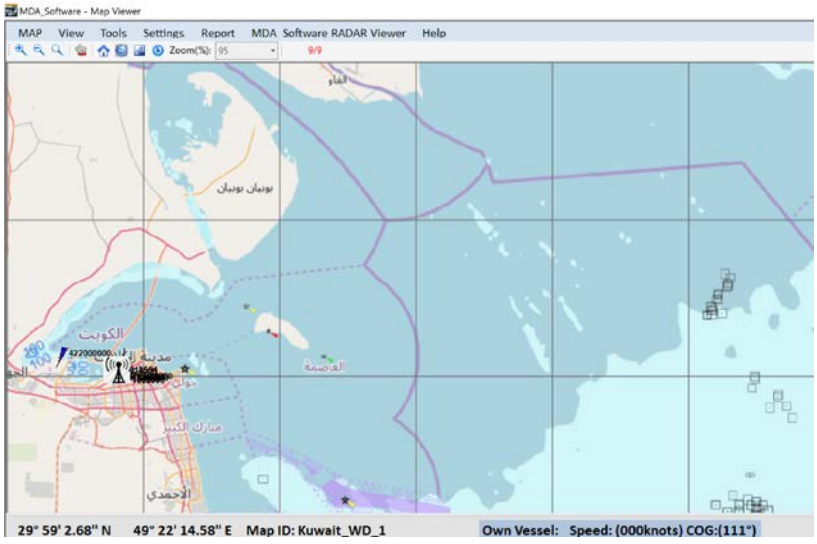

Figure 19: Screenshot sample of the "offline" software

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6 Results

The result of the first reception was tremendous, we received after seconds already vessels and after some minutes after the installation on the roof, we had more than 570 vessels (Class A and Class B mixed) on the screen. The largest Distance was 499nm. (Our screen range only reaches 500nm) = more than 920km (See Figure 18: Screenshot of the "cloud" software, vessel in Dubai was seen!)
The 499nm was not a “special” effect, there were several other vessels at 450nm, too.
At this first test, still no vmsTRACK-PRO was installed.

Next day (27th Aug 2019) the vmsTRACK-PRO was installed on the fishing vessel (See under 3.2.1)
At the 28th Aug 2019 two transmitters were installed on pleasure boats.

The pleasure boats have got the MMSI numbers:
87722102
87722151

The Fishing vessel has got the MMSI number:
87722163

6.1 Range

At the first tests a range to the fishing vessel of about 60nm was reached. More tests to be done. The theoretical range could be around 80nm, this has to be proofed by further tests.

7 To be improved-Potential

7.1 Installation of the receiver

The installation of the receiver at the roof must be improved, by sun shadows and good cable lead and fixing. Also, the antenna pole on the roof must be improved.

7.2 Installation on the boats

We had the feeling that the installation of the transmitter at the fishing vessel, close to the generator is not ideal. We recommend to replace the transmitter so that it will not at all disturbed by the generator and to test it again.

The installation on the pleasure boats with regards to the position is fine, but the mounting was only made by cable ties, this has to be improved with a screw mounting.

7.3 Software

There were several comments on the Demo Cloud and the offline software, especially for the map and its exactness. But this is not a topic for real application, as it is a demo with “open source” maps. In real application “admiralty” maps can be used.

8 Summary

The tests did work with a wonderful result. Range and installation are very good. Details to be improved and further test results to be collected.
It is a great technology for the Fishing Authorities in Kuwait. It has to be decided whether Sat Locating is necessary at all.

Alfred Kotouczek-Zeise
CEO Weatherdock AG
29th August 2019