

WIRELESS DATA TRANSFER FROM A STRAND CONDITION MONITOR TO A PC/LAPTOP 🏠

Sarclad is a UK headquartered company providing advanced technology products for the metals industry; with over 30 years experience in supplying equipment to all of the leading steel manufacturers and OEM suppliers of steel manufacturing and processing equipment.

THE REQUIREMENT & THE SOLUTION 🏠

The customer required a wireless method of data transfer from a Strand Condition Monitor to a PC/laptop. This was always going to be a challenge due to the amount of electrical noise present in a steel making environment.

It was agreed that the first issue to be resolved was the operation mode. The system in place was running in ADHOC mode using a **Moxa Nport W2150A** wireless device server as the method of communication between the SCM (Strand Condition Monitor) data logger and the customer's PC. Although this set up was seen to transfer data in a controlled workshop environment, under site conditions it was seen to be unstable, and 7 out of 10 attempts to connect would result in failure.



The software problems were many and significant, initially after connecting via Windows, the SCM.041 software would be opened, and then through operator intervention the download button would be pressed to attempt to connect to the Moxa Nport via x-modem. This was seen to be unreliable, x-modem was disabled and the SCM.041 software would attempt to establish a connection using an Apro application. If successful, a download would be possible however as the system was operating in ADHOC mode, signal drop outs were common. Once a connection was lost it became difficult to re-connect as the

communications code inside the SCM.041 software would not know what state the communication ports were in (open or closed), and would on many occasions, eventually crash. It was agreed that the software department would write a stand-alone communications sub-system, which would be fully tested under laboratory conditions, connecting to the Moxa Nport via a **Moxa AWK 6222** (dual oscillating radio 2.4Ghz/5Ghz) access point operating in INFRASTRUCTURE mode.

The communications sub-system was then integrated into the SCM.041 software, operating with a baud rate of 115200. Five commissioning measurements along with a site calibration file were copied onto the Dlogger software. This run data and calibration file was seen to download and analyse without any major problems. After experiencing some initial minor problems with software timers and inherited access violations, it was observed that the Dlogger software would continue to send data when a connection was lost (to simulate a break in communications the power supply would be switched off to the AWK6222), and eventually the Dlogger would freeze up.

The problem with the Dlogger freezing up was addressed, and the hardware was tested again for stability. On Windows boot up the Sarclad laptop automatically connects to the AWK 6222, and establishes a secure connection. The power supply was then removed from the AWK 6222, when the supply was reinstated it was observed that the Sarclad laptop would again automatically connect with the AWK 6222. When the SCM test rig supplying the Nport W2150A with a stable 12V supply was shut down, simulating a 'Brown out' and then switched back on, it was seen that it takes approximately 30 seconds for the Nport to boot up and securely reconnect to the AWK 6222, and in turn reconnect to the Sarclad laptop. During the set-up of the Moxa AWK 6222, an electrical noise cancelling function was enabled to prevent the excessive noise experienced in steel making environments interfering with the wireless connections.

THE RESULTS ▾

Between 06/11/12 and 17/11/12 a visit to Steel Plant A and Steel Plant B was carried out to install and commission the Wi-Fi data download system. The first site to be visited was Steel Plant A where the MOXA Nport was programed and installed into the SCM.

The MOXA AWK 6662 access point was programed and installed on the caster floor in the vicinity of the SCM. The port adapters on the Sarclad laptop were then configured, and the system was re-booted.

Upon the SCM booting up the Sarclad laptop automatically connected to the access point with the SSID being displayed in the Windows connection window, the SCM laptop connected to the access point without any user intervention. After the connection was established data was seen to download. However the calibration screen did not work when attempting to calibrate via Wi-Fi, this was a software issue and the software department released v803 to address the problem. The calibration screen was seen to send and receive calibration files although a full SCM calibration was not carried out as the calibration equipment was not available. A total of six measurements and two dummy runs were downloaded, Plant A accepted the system as operational. The Wi-Fi was seen to be stable and reliable with a download radius of approximately 1km with the power set to 50%.

At Steel Plant B the system was set up and installed in the same way as at Steel Plant A with exception of the SSID which was set to 'invisible', and the security being set to WPA2 at the request of the customer IT department. The access point was installed into the PLC room with a stable power supply.

The system was again seen to be stable and a full SCM calibration was carried out via Wi-Fi. After the calibration two measurements were made and the data was seen to download successfully at a distance of approximately 60 meters. Steel Plant B accepted the Wi-Fi as being operational.

WHY AMPLICON 🏠

Amplicon was selected for this project as they could clearly demonstrate a high level of technical knowledge combined with many years of experience with wireless networks. Liaising with our technical sales and applications engineers (free pre and post sales support), ensured that the solution specified was highly competent and cost effective.