Orbit Newsletter Digital Publication

Q3 2022

Orbit 60 Series Update: Installation Success!

Introduction

Welcome to our 11th article focused on Orbit 60 and Orbit 60 enabled enhancements. In this article, we'd like to highlight our first commercial installation, which was completed just about a year ago, in October 2021. By chance, I am quite familiar with this installation, as it occurred at a petrochemical refinery just outside of my home base of Philadelphia, PA, and I have known and worked with the end user for more than a decade.

Our past articles have focused on the cyber security, hardware, configuration, and System 1 aspects of the system, you may follow the links below to access them:

- Q1 2020 Orbit Article – Introducing Orbit 60
- Q2 2020 Orbit Article – Available to Quote – Explore the Cost Savings
- Q3 2020 Orbit Article – Now – Less Spares!! – How to Choose Input Modules
- Q4 2020 Orbit Article – System Fundamentals – Output Cards
- Q1 2021 Orbit Article – Cyber Secure Condition Monitoring!
- Q2 2021 Orbit Article – Orbit Studio Configuration Software
  - "Beyond the Basics Webinar" – Configuring Orbit 60 with Orbit Studio Software
- Q3 2021 Orbit Article – API 670
- Q4 2021 Orbit Article - Dispelling the rumors – 3500 is NOT obsolete!
- Q1 2022 Orbit Article – System 1 and Orbit 60
- Q2 2022 Orbit Article – New Features Enabled with Release 22.1

We should mention an emphasis on the word “commercial” in the opening statement. We did a dozen, and a half field trials with Beta units prior to releasing the actual product. In the field trials, we connected the Orbit 60’s to the buffered outputs of our customer’s actual operating 3500 racks. We then configured them to mimic the functionality of the host 3500 racks, and then watched them perform. These beta tests are an important part of the development process, and allow us to figure out what works, and of equal, if not greater importance, what doesn’t. We went through this extensive process to ensure that our commercial units would work properly on Day 1.

You may be wondering what the first Orbit 60 (actually first two Orbit 60’s) were deployed on, and why? These are great questions, and I wish the answer was a bit more “interesting,” but, the first two units were used to replace some very old (and obsolete) 3300 monitors that were using radial X-Y vibration, single thrust probes and bearing temperatures to protect two 1250 Hp polypropylene Cycle Gas Reactor Compressors. The motors for these compressors were not outfitted with vibration sensors. They are quite old, and according to the manufacturer, it would be too difficult to retrofit them with proximity probes, as there isn’t enough structure to hold them. The motors are therefore protected by the bearing temperature probes.

The monitors were mounted in the same Outdoor, Class 1, Div 2, air purged cabinets that the 3300 monitors were originally located. This saved time & expense. The cabinets face the West and do get some afternoon sun, but so far this has not been a problem. Orbit 60 does have its own internal temperature telemetry sensors, but the firmware for reporting on them has not been developed yet (although the data is currently available in the system logs).

Blanking plates were required as the Orbit 60 monitor is significantly shorter and narrower than the existing 3300 systems they replaced. These were designed and fabricated by our end user customer.

All existing transducers were reused. In addition, a second thrust probe to accommodate voting was added to each machine. The brackets for these new probes were provided and installed by our customer. The Keyphasor on one of the units had to be moved in order for it to be located over the notch. This required design and fabrication of a new bracket.

The Bently Nevada Projects team was responsible for the rest of the installation. We generated the Electrical Drawing package and supervised the customer's electricians. We also verified the FAT configurations of the units, uploaded the latest firmware, and configured their relay logic using Orbit Studio configuration software.

The plant had us install and configure System 1 specifically for these compressors.

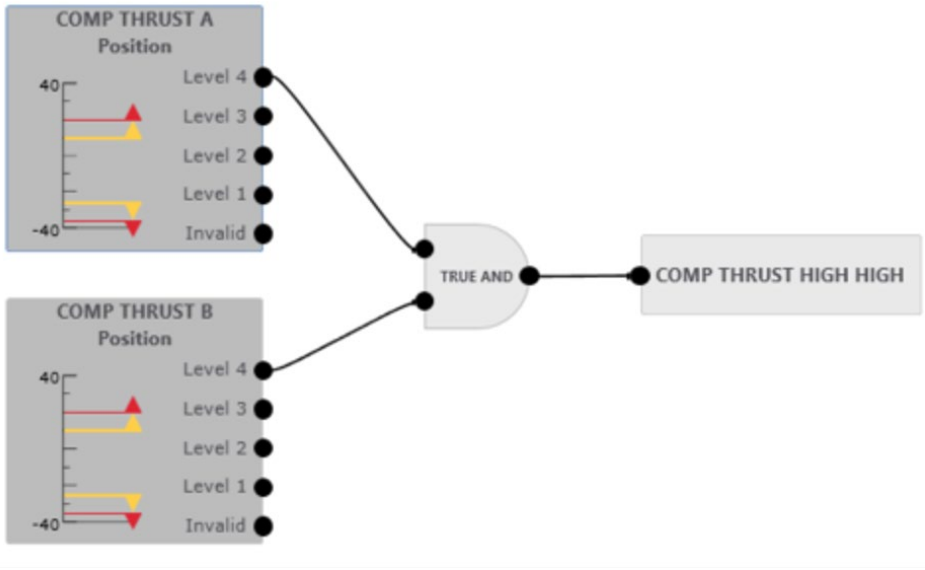
A full system checkout was performed on both units to make sure everything was operational prior to startup. This includes running probe curves on the prox probes to make sure everything is calibrated properly. Test signals were also injected to make sure that the relays would fire when expected, and that System 1 is receiving the expected data. The checkout also extended to making sure the Modbus communications were also working as expected.

Regarding our electrical designs, the customer's project manager told me that they were a "super helpful point of reference for the installation of our first Orbit 60." And "It was nice to have them in case there was something that we were unaccustomed to…"

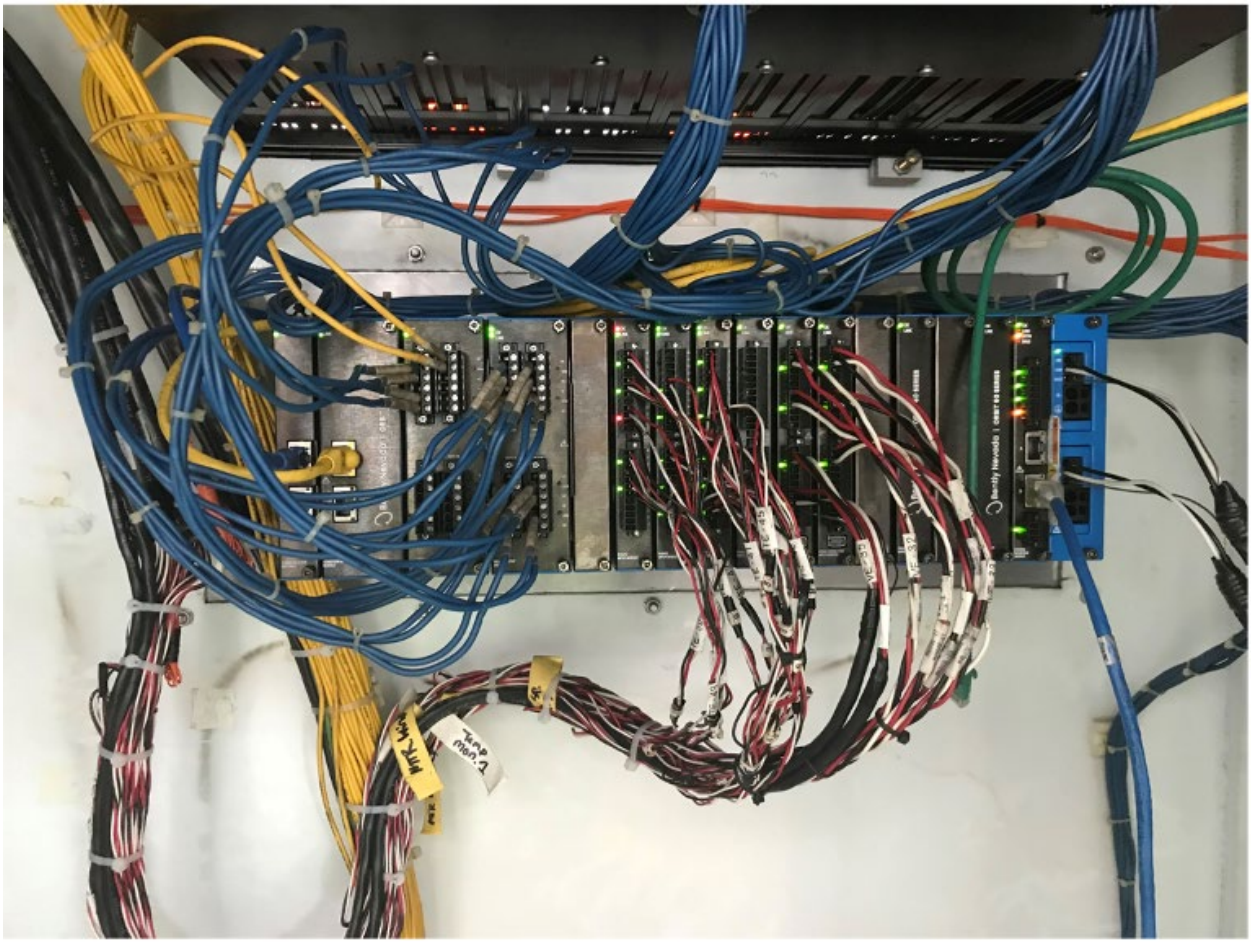
Further, these compressors are located in two separate areas of the plant, approximately 200 yards from each other, which is why two Orbit 60s were used. The entire two rack retrofit project was completed within eight days, which was pretty quick due to the amount of physical changes, loop checks, and newness of the system.

Some of our customer takeaways were:

- Liked the similar feel between Orbit Studio and BNMC software
- Appreciated the individual channel indicators on the back of the rack (Tri-color LEDs indicate OK, Bypass, Alarm for each individual transducer)
- Liked the Relay Logic configuration which shows the gate logic
    - Wait until they see it with color coding!! (Author's comment)
        - If the screen shot below was "live" and connected to the rack, we would see the current thrust levels for each probe



- Liked the enhanced MODBUS capabilities, and especially how the maps are constructed in Orbit Studio
- Especially liked being able to pull up ALL of the bar graphs during startup
- Liked having Keyphasor gap available



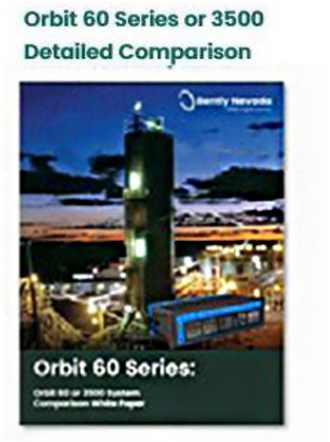
The system has been in operation almost a full year and has been operating as expected.

Overall, our customer is very happy with his Orbit 60's and is planning on installing his next Orbit 60 units on some extruders, where he will be able to take advantage of our expanded rolling element bearing capabilities.

More information is available on our website

Next Steps

Our teams are excited to discuss Orbit 60 in more detail. We have multiple technical white papers available for a deeper dive into the following topics. Please reach out through the contact us link below to receive a copy and we will connect you with your local expert.



- **Orbit 60 Series or 3500 Detailed Comparison** - This document details the difference between Bently Nevada's Orbit 60 Series machinery protection system and the 3500 system.
- **Orbit 60 Data Security Condition Monitoring Module** - This document is intended to describe how the Condition Monitoring Module in the Orbit 60 Series Monitoring System provides a secure solution with full high-resolution data to external networks without jeopardizing the operation of the protection functions.
- **Orbit 60 Series Bridging Concepts** - Bently Nevada introduces the concept of bridging with the Orbit 60 Series system architecture.
- **Coming Soon:** Protection Schemes & 3500 Retrofit White Papers

Orbit 60 Request Form

Learn more about Orbit 60

Data Sheet

Fact Sheet

Product Video - Orbit 60 Teaser

Product Video – Orbit 60 Full length

Orbit 60 Series and System 1: Bloomberg TV:

Houston Chronicle: Bently unveils the Orbit 60

Turbo Machinery Magazine – Bently Nevada's New Platform

Why Orbit 60? Why Now?

Q1 2020 Orbit Article – Introducing Orbit 60

Q2 2020 Orbit Article – Available to Quote – Explore the Cost Savings

Q3 2020 Orbit Article – Now – Less Spares!! – How to Choose Input Modules

John Kingham, P.E.

Sr. Application & Solution Architect
Bently Nevada, a Baker Hughes company.

E john.kingham@bakerhughes.com

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