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Nextelligence® Newsletter

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Environmental
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Welcome to the Nextelligence Newsletter!

Welcome to the 15th edition of the Nextelligence Newsletter. We look forward to continuing to provide the latest news in the Nextelligence training community.

TIDMORE'S
Nextelligence Tech Tips
From Master Trainer Donald Tidmore

PWM Explained - Pulse Width Modulation: What is PWM, and how do we use it?

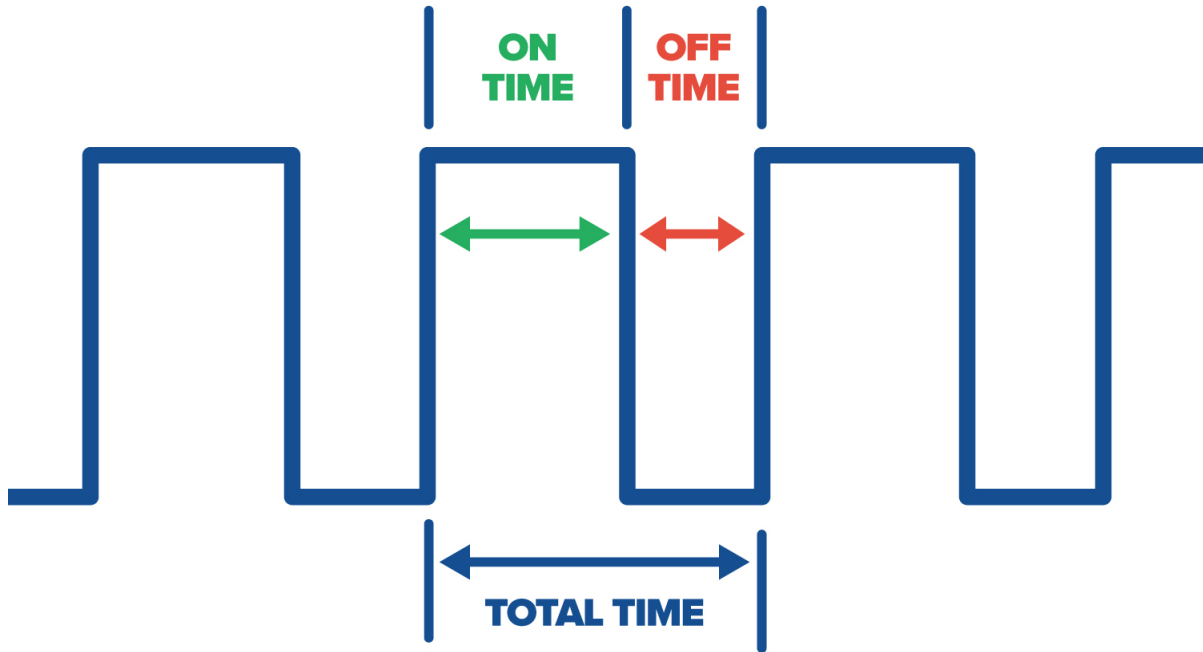
This month's edition of the Nextelligence Newsletter will discuss pulse width modulation (PWM) and how we use it in the garbage truck industry.

What is PWM?

Typically, a 12-volt DC circuit is either on or off and nothing more. This can be used to turn something "on" or "off". In addition to turning

something on and off, we add a “time” component with PWM, which enables control of analog devices with a simple digital device.

If we could see this voltage as it turns on and off or pulses, it would look like the square waves below.



PWM technology has expanded over time, with thousands in use, and can be found controlling drones, garbage trucks, transmissions, and even automobile fuel systems.

If you think about it on a simplistic scale, PWM is like a dimmer switch in your house; when you turn the dial or move the slider up and down, you are increasing and decreasing voltage. We can physically see the change when the lights dim or brighten. Turn the dial fast, and the lights change at a faster rate; turn the dial slow, and the lights respond accordingly.

PWM is used to improve the performance of the joystick by enabling it to move at various speeds. In this case, the distance the joystick is moved determines the speed of the lift arm. Move the joystick a quarter of the way, and you get 25% of the speed; move it halfway and get 50% of the speed. We pulse or turn the voltage on and off over a period of time.

Let's Look More In-Depth, How It Works

The spaces in between each waveform are the voltage turning on and off. Notice the positive voltage is on at the top of the waveform and off at the bottom of the waveform. The duty cycle or on-and-off speed of the voltage controls the device's speed. You can see this below. At 0 volts, the voltage line would be at the bottom of the scale, and 100% voltage, the voltage line would be at the top of the scale. When at 50% speed, the voltage is off for 50% of the time and on for 50% of the time. At 75% speed, it is on 75% of the time and off 25% of the time, and at 25% speed, the voltage is on 25% of the time and off 75% of the time.

The line at the top of the scale = 100% of the 12 volts or 100% of the source voltage used in the circuit.

Line at the bottom of the scale = 0 volts.

50% Duty Cycle



75% Duty Cycle



25% Duty Cycle



Suppose an automated side loader operator has a container close to an obstacle (such as a car or mailbox). In that case, the operator can use PWM technology in the joystick controls to slowly extend the arm, grab the container, dump it, and replace the container with much more finesse than if the arm went out at full speed. PWM can also reduce the cab shake that causes driver fatigue by allowing a much smoother lift arm function over running the lift arm at 100% speed.

Would you like to know more about Pulse Width Modulation and related topics? Good news! We teach that in our Nexteligenz MAT classes. You can get in-depth training by contacting us to register for a Nexteligenz MAT class at: Nexteligenz@doveresg.com

Contact Info & Helpful Links

Miss a Newsletter?

No problem - You can now view all past Nexteligenz newsletters by visiting our Archives page.

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The 2024 Nexteligenz Training Schedule Is Here!

The 2024 Training Schedule is now available and can be viewed via the Nexteligenz webpage, or on the Heil Dealer Portal.

2024 Live Online Webinar MAT Training Schedule

ONLINE TRAINING DATES	PRODUCT	TIME
February 6th & 7th	PowerTrak Commercial & PowerTrak Commercial PLUS	9:00 - 11:30am CST
March 5th, 6th, & 7th	DuraPack Python	9:00 - 11:30am CST

2024 Factory MAT Training Schedule

FACTORY TRAINING DATES	PRODUCT	TIME
January 23rd & 24th	Half/Pack Commercial	8am – 4pm CST
February 20th & 21st	DuraPack Python	8am – 4pm CST
March 12th & 13th	RevAMP	8am – 4pm CST

[View Full 2024 Training Schedule](#)

Nextelligence Class Registration

Feel free to contact us anytime if you have any training questions or to register for one of our training classes.

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