



# Powering Access Control with 802.3bt PoE

Whitepaper

## Introduction

Our **Tango PoE Driven Power Supply/Charger Series** with Lithium Iron Phosphate Battery Backup is an industry game-changing power solution that allows 12VDC and 24VDC devices to be powered simultaneously via 802.3bt PoE input. Unlike Hi-PoE (60W), IEEE 802.3bt, also known as 4PPoE or 4-Pair PoE, uses all four pairs of wire in a structured cable to evenly distribute power. This new standard allows manufacturers of powered devices to design new products with power hungry features such as PTZ cameras w/ IR illuminators and heaters & blowers for harsh environments and more.

There are several sources for PoE injectors that can supply 4PPoE for Tango, such as Altronix NetWay Midspans which are available in single port or multi-port options, which eliminates the need for multiple individual power injectors for larger projects.

## Reduced Installation Costs

Traditional power supplies, hardwired with high voltage are typically used for the deployment of electrified locks. These power supplies generally take 115VAC/220VAC power input and reduce this to a 12VDC or 24VDC output. That single output is then connected to a distribution board where the electrified locks are connected. Most jurisdictions require that this power input be hardwired with a dedicated circuit. Due to the need for high voltage, a certified electrician must be used for this type of installation.

Security Integrators that are required to provide high voltage in their scope of work increases the cost of their installation. For instance, in large cities like Chicago, Boston, New York, Philadelphia, etc., electricians often have offices in the very same building the access control system is being installed, which limits options when contracting an electrician to do the work. Additionally, because of high voltage, the installation now requires dedicated conduit runs for the electrical as well as expensive large gauge copper and dedicated circuit breakers. After initial installation, regulatory compliance may be required to service the system. The new 802.3bt 4PPoE standard helps curtail the costs outlined above.



## Traditional Access Power System

Requires an electrician to provide 115VAC High Voltage Input.  
High Voltage wiring must separate from low voltage inside the enclosure.  
High Voltage wiring cannot be in same pathways/wire runs with low voltage wiring.

## New Access Power System with Tango

Security Technician can wire up the power input.  
Power (PoE) is run over Cat6 cabling and share same pathways as other low voltage wiring.  
Lithium Iron Phosphate (LiFePO4) battery charging.



## Powering Access Control Systems with 802.3bt

As previously stated, 4PPoE can deliver up to 90W of total power. At 100m from the power sourcing equipment, Tango1B 4PPoE Driven Power Supply/Charger provides 60W of power combined, 12VDC and 24VDC simultaneously. Total is determined after accounting for voltage drop on Cat5e. Shorter cable runs can provide up to 72W for use at the Tango1B. While there are adapters that convert PoE to 12VDC or 24VDC, the available power is limited. With up to 72W available, the flexibility to power an entire access control system with 4PPoE is a reality. This includes powering the access control panels, locks, readers and ancillary devices, while providing a battery charging circuit with a single Cat5E or higher cable. The Tango incorporates an 8-pin connector which allows for our stackable PDS8 power distribution board and ACMS8 access power controller to be mounted directly on top of the Tango board, where the 12VDC and 24VDC power is transferred to the distribution board via the 8-pin connector. This allows simultaneous 12VDC and 24VDC selectable outputs with visual indication of the specific voltage steered to each output.

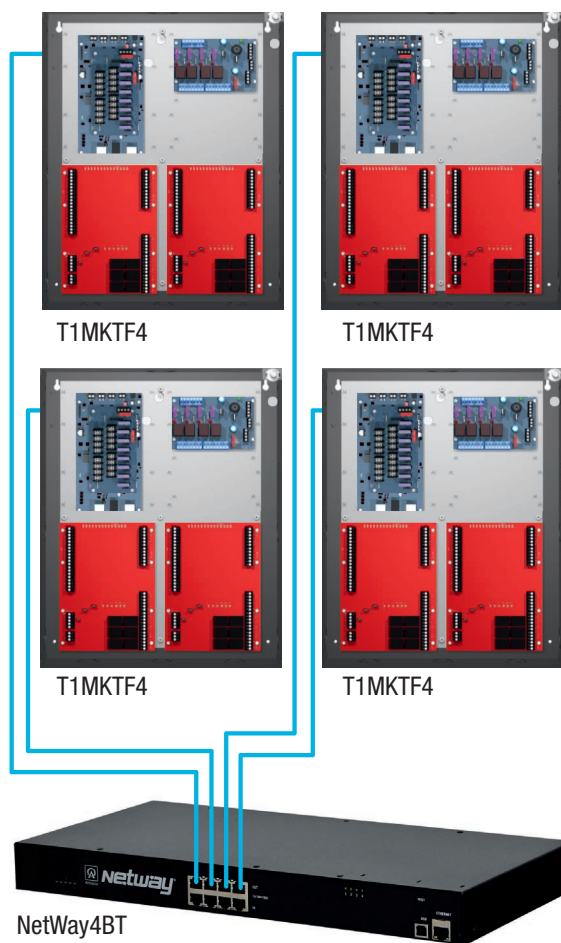
Below is an example of an 8 door access control deployment using Mercury boards, one of the most widely used platforms in access control, as the foundation of the system. Based on this example, you can see that 60W can potentially power an entire 8 door access control system.

### Powering an 8 Door Access Control System

QTY	Device	Total Current	Voltage	Watts
4	Mercury Boards	2150mA	12VDC	25.8W
8	Card Readers	440mA	12VDC	5.3W
8	Electric Strikes	1200mA	24VDC	28.8W

**Total system draw: 59.9W\***

\*Calculations based on product specification sheets



Power up to a 16 Door Access Control System with Tango PoE Driven Power supply/chargers in Trove wall mount units. Utilize stackable PDS8 power distribution boards on the Tango1B and ACM4 access power controllers for locking devices – saving valuable space. All powered by a 4-port NetWay4BT 802.3bt injector.

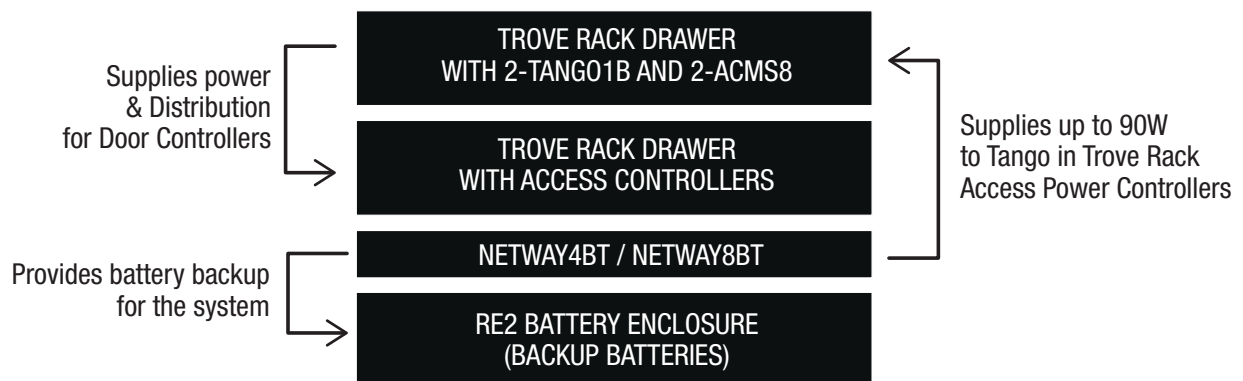
## Benefits

Examining the benefits of Tango further provides a solution that also leverages best practice IT installations to conserve power and serve as a single point of maintenance for back-up batteries. For instance, the IT rack will likely house the Altronix brand midspan, which features a battery charging circuit. The IT rack may also have conditioned power and be supported by a back-up generator should there be a local AC power failure. When providing battery back-up for the PSE at the IT rack, using the Altronix RE2 rack mount battery enclosure with four 12V 7Ah batteries, the designer can eliminate the need for back-up batteries to be located in the field at each enclosure. This serves to eliminate the need to service batteries at multiple locations within the facility – saving time and labor for annual or routine battery maintenance.

Additionally, without the need to utilize the on board battery charging circuit of the Tango1B, the designer saves an additional 10W of power which can be used for additional devices or as a factor of safety for system power.

Furthermore, it is not uncommon to utilize two power supplies based on the demands of an access control system. The designer may choose to deploy two Tango1B 4PPoE power supplies in a single enclosure to ensure that there is plenty of power for the system. Potentially using one Tango1B to provide power to all 12VDC devices and the second Tango1B to provide 24VDC.

### PoE POWERED RACK MOUNT ACCESS SYSTEM



## Conclusion

Using low voltage installation methods to power your access control system will eliminate the need for an electrician and associated costs such as permits, electrical cabling and dedicated conduit. The low voltage cable used for power can run in the same cable trays and paths as other network cabling along with access control cable. For service and maintenance, the lack of high voltage inside the enclosure eliminates the need for regulatory safety precautions. A key feature of the IEEE standard is that there is no voltage present on the cable from the PSE until it is plugged into a Powered Device and a handshake occurs. Unplugging the Ethernet cable from the PoE driven power supply is safe. Once the cable is plugged back in the handshake is performed with the power source and PoE is delivered to a powered device.

Make no mistake, today there is a demand for more power to support additional network connected devices. IEEE 802.3bt, also known as 4PPoE will be the catalyst that makes smart buildings a reality. Take full advantage of Tango and its characteristics to allow for more efficient, cost effective and safer installations.

Altronix Tango1B is backed by a lifetime warranty.



A global leader in power and data transmission, Altronix designs and manufactures innovative solutions that maximize overall performance and efficiency. Our power products and peripherals feature the quality, reliability and unparalleled customer support that have been associated with Altronix for over 30 years.

Altronix products are backed by a Lifetime Warranty.

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