



## Surge Protection Requirements for Intelligent Traffic Systems (ITS) & Dynamic Message Signs (DMS)

### Overview of NTCIP and NEMA TS 4-2016

NEMA TS 4-2016: section 10.2 Power Panels states: *“A power panel shall be installed in accordance with NEC, it shall contain, as a minimum [] voltage surge and lightning protection.”*

All agencies have placed a greater emphasis on increasing personnel safety by mandating the use of Surge Protective Devices (SPDs), including the NEC & NFPA.

NEMA standard TS 4-2016 which recognizes the threat and subsequent failure of ITS equipment due to transient surges & lightning. (NTCIP 9001)



### Threat to Intelligent Traffic Systems & DMS

A 2017 study commissioned by the Electrical Safety Foundation International (ESFI) finds that 94% of those surveyed find surge protection to be significantly important part of facility protection and safety. (2017 ESFI)

These Threats can include:

#### Disruption

Surges can enter data lines through inductive coupling which can result in corrupt data processing

#### Degradation

Repeated stress can cause component degradation and shorten the lifespan of equipment. This may not result in any visual damage

#### Destruction

Immediate failure to a device due to a high level of energy from a surge. This can include burnt PCB's and melting electronic components





## The Solution for Intelligent Traffic Systems & DMS

These standards have only just begun to address the expanding role that surge protection plays in preserving the integrity of equipment and, more importantly, protecting the lives.

The installation of Surge Protective Devices (SPDs) within the Traffic Cabinet or DMS control circuit is a measure that will not only extend the life of the circuit components but also increase the reliability of the system as a whole.

### Application of the “Box Concept” for Surge Protection

The installation of a Surge Protective Device (SPD) at all electrical entrances of the DMS or Traffic cabinet is the only way to completely harden the entire system. This means every copper wire entering or exiting the cabinet must be protected. This means power, data, ethernet, signaling, coax and others.

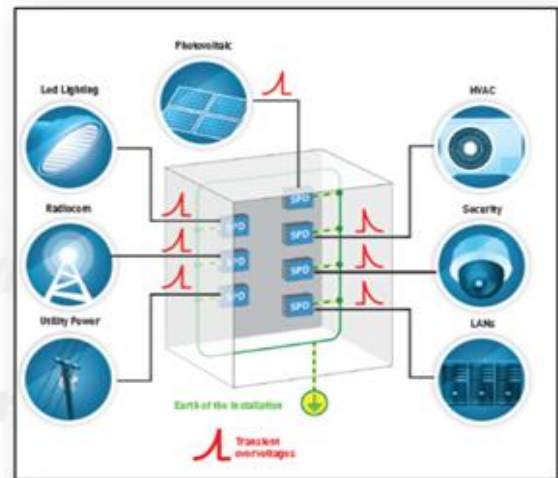
### Preserving ROI

Surge protection is a cost-effective solution to prevent downtime, improve system and data reliability and elimination of equipment damage due to transients and surges for both power and signal lines. It is suitable for any facility or load (1000 volts and below). (2014 NEC)

### Selecting the appropriate SPD

NEC/NFPA 70 require that Surge Protective Devices (SPDs) be UL Listed. This means selecting a surge protector is easier than it has ever been. There are only a few choices available for SPD's that are UL Listed for any of the most commonly used surge standards including UL1449 4<sup>th</sup> Edition, UL497B, and UL497E.







### The “Box Concept”



**Protect All Copper Wires!  
Leave No Vulnerabilities!**



## Intelligent Traffic Systems & DMS SPD per Application

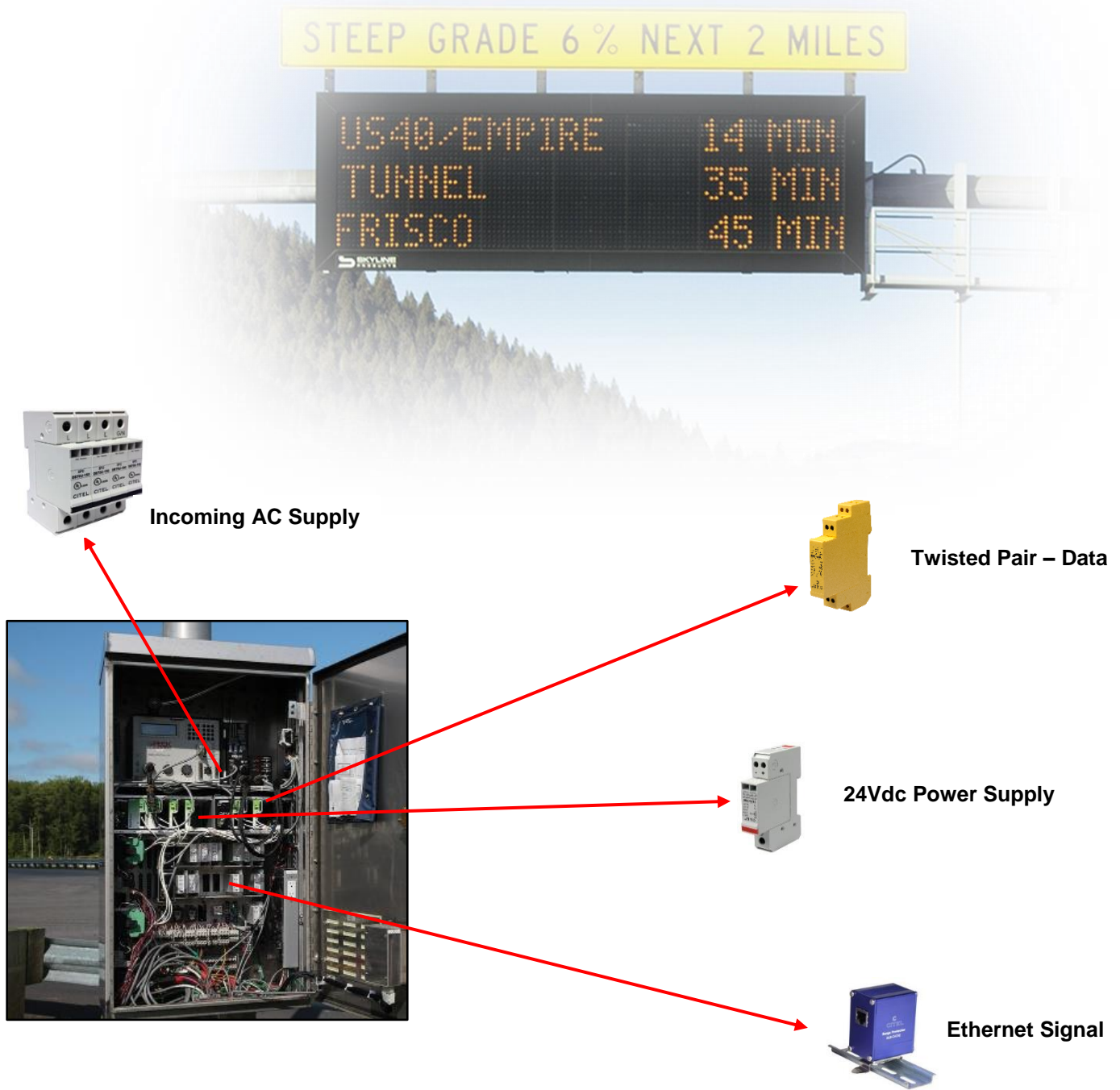
| Application                                 | CITEL Solution Reference | CITEL Solution Pictures   |
|---|--------------------------|---|
| 120/240Vac or 120/208Vac Incoming AC Supply | DS70US-120/240           |    |
| 120Vac Power Supply                         | DS72US-120S              |    |
| 24Vdc Power Supply                          | DS220S-24DC              |  |
| Twisted Pair – Data lines RS485 & 4-20mA    | DLA-12D3                 |  |
| Ethernet Signal                             | MJ8-Series               |  |
| Wireless Communication                      | P8AX09-6G-N-FF           |  |

UL Listing ensures the highest quality safety testing has been conducted





**Intelligent Traffic System & DMS SPD Primary Location**





## References

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