

Wisconsin Traffic Engineering Council

Issue Paper 18 – State of the Art in Traffic Signal Controllers



Background / Overview

Traffic signal controllers in the US have represented two different specification strategies which were developed in the 1970s. In 1976, most control unit equipment manufacturers in the United States voluntarily agreed to conform to standards developed through the National Electrical Manufacturers Association (NEMA). In 1979 the Federal Highway Administration, states of California and New York developed the Type 170 controller that uses a general purpose microprocessor and a variety of software for different applications. NEMA controllers have standard functions and input-output format, but several digital electronic techniques are used by manufacturers to provide the functions. The Type 170 controller uses fixed hardware and varies functions by altering the software. NEMA controllers now conform to TS-1 or TS-2 standards while the Type 170 controller has evolved into 2070 controller unit. AASHTO, NEMA and ITE jointly developed the Advanced Transportation Controller (ATC 5.2b) standard for an open architecture design to bring together the best concepts from 170 and NEMA paradigms to create a field controller platform that will serve many ITS functions. The ATC controllers can run multiple on-street applications simultaneously from one unit. Applications include traffic surveillance, lane use signals, ramp meters, video detection master, HOV, HAR, CCTV, light rail transit support, dynamic message sign support.

State of the Art Traffic Signal Controllers

Siemens Sphere ATC

- Can operate in NEMA or CALTRANS environment
- Meets ATC 5.2b standard
- Exceeds NEMA TS1 and NEMA TS2 standards
- Compatible with CALTRANS 2002 TEES, 2070 ATC
- Backward compatible to NEMA TS1 and 170



Econolite ATC2070

- Can operate in NEMA or CALTRANS environment
- Meets ATC 5.2b standard
- Meets NEMA TS1 and TS2 standards
- Compatible with CALTRANS 2002 TEES
- Backward compatible to NEMA TS1 and 170
- NTCIP 1202 compliant



Peek ATC CBD

- Meets ATC 5.2b standard
- Designed specifically to meet New York City Department of Transportation requirements.
- NTCIP 1202 compliant



McCain ATC eX NEMA

- Meets ATC 5.2b standard
- Meets NEMA TS1 and TS2 standards
- Backward compatible to NEMA TS1
- NTCIP 1202 compliant (Omni eX software)



Siemens EPAC M50

- Exceeds NEMA TS-1 and TS-2 1998 standards
- NTCIP compliant
- Ethernet port
- Infrared port for communications
- Removable hand-held front panel display



Econolite ASC/3

- Exceeds NEMA TS-1 and TS-2 1998 standards
- NTCIP compliant
- Optional Ethernet port



Peek 3000E

- Exceeds NEMA TS-1 and TS-2 standards
- Offers customized D module compatible with other vendors' D modules
- NTCIP compliant
- Optional Ethernet port



Traffic Signal Controllers in the US

States of California and New York use 170/2070. The rest of the states follow NEMA standards. New York City's 12,300 signals are being upgraded to Peek ATC CBD from the electro-mechanical controllers from the 1950s. Illinois has been moving to NEMA TS-2 controllers.

Traffic Signal Controllers in Wisconsin

Wisconsin DOT: 950 signals statewide (460 in SE region) with a mix of Siemens and Econolite TS-1 controllers, moving to TS-2
Milwaukee County: 84 TS-2 cabinets with Siemens and Econolite controllers
City of Milwaukee: 749 303/330 cabinets with 170 controllers

Additional Resources

- <http://www.econolite.com/products/controllers/>
- http://www.itssiemens.com/en/t_nav112.html
- <http://www.mccain-inc.com/controllers.html>
- http://www.ustraffics.net/products_traffic_control.php
- Advanced Transportation Controller Standard 5.2 b
<http://www.ite.org/standards/atc/>
- NEMA standards for Traffic Controller Assemblies
<http://www.nema.org/stds/ts2.cfm>
- National Transportation Communications for ITS Protocol www.ntcip.org
- Traffic Signal Standards
www.ntoctalks.com/webcast_archive/to_feb.../to_feb_23_05mf.ppt
- Traffic Signal Timing Manual
http://ops.fhwa.dot.gov/arterial_mgmt/tstmanual.htm

