



# *ATC CyberCabinet®*



SRE Services, LLC

[www.SreServicesLLC.com](http://www.SreServicesLLC.com)

# *CU Database Test & Validation*

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**For Traffic Engineers, it is often a challenge to test CU control programs and visualize the results.**

- ▶ The many problems they face are:
  - Configuring a physical test traffic cabinet to match the on-street configuration under test
  - Generating detector & preemption inputs to force CU outcomes
  - Visualizing the CU signal outputs in an easily recognized format
  - Validating compatibility with the CMU configuration.
  
- ▶ Today, their best option is bringing the actual physical cabinet to the lab with detector test switches installed (assuming loops) and connecting a generic display panel.

*With intersection complexities growing, the problem will only get worse over time.*

# *CU Database Test & Validation*

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If only there was an easier, cheaper, and better way to exercise and validate a new or modified CU database, then Engineers could spend more time designing and testing.

The *ATC CyberCabinet*<sup>®</sup> software provides this easier, cheaper, and better way to exercise and visualize the Controller Unit operation, without the cost and trouble of a hardware traffic cabinet.

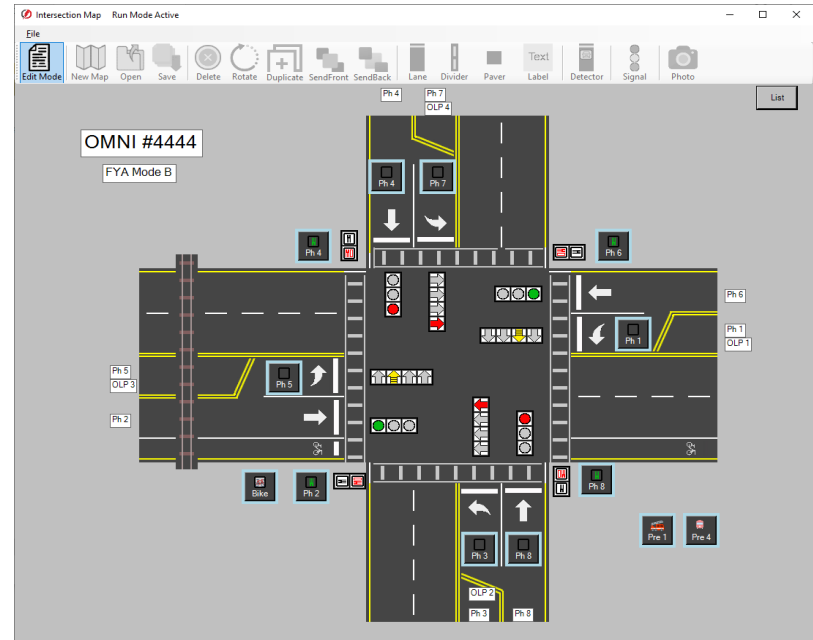
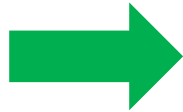
*This will produce higher quality results in less time, while reducing or eliminating the need for call-backs once the intersection is operating.*

# ATC CyberCabinet Software

The *ATC CyberCabinet*® program provides a traffic signal Engineer with a software based solution to test and validate the functionality of an ATC Controller Unit (CU) database operating with the actual CMU configuration, without needing a full ATC5301, NEMA TS2, ITS Cabinet, or TEES 332 Cabinet Assembly in hardware.



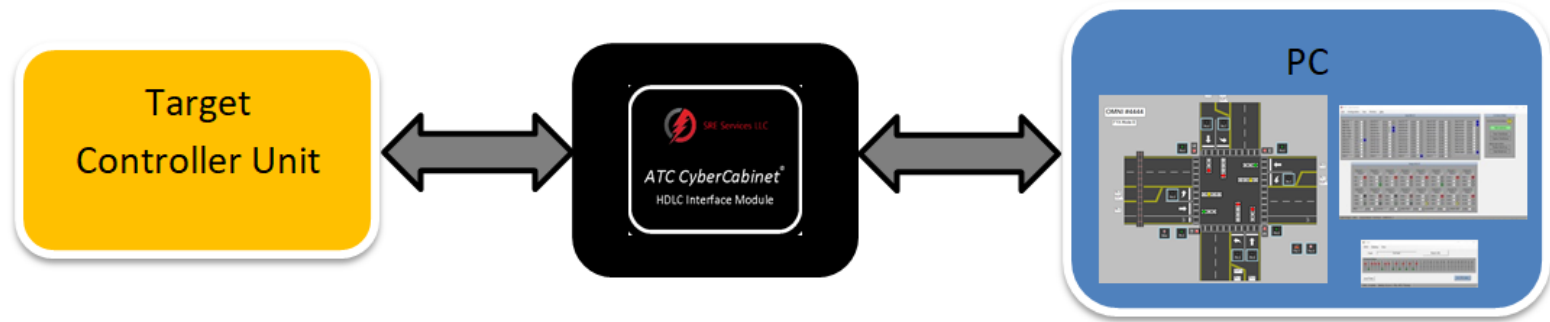
Photo courtesy of McCain Inc.



# CU Direct Mode

The *CU Direct* mode responds to SB#1 HDLC commands from the target CU using the *ATC CyberCabinet HDLC Interface Module*.

***No other hardware is needed.***



A time-stamped (sniffer) Log of SB#1 command and response frames between all devices is provided for detailed trouble shooting and replay.



# *Cabinet Device Emulation (ATCC)*

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The software emulates the functionality of the ATC5301 input/output Serial Interface Units (SIU) and the Cabinet Monitor Unit (CMU2212)

▶ **Up to seven SIUs are supported:**

- Two Output SIUs
  - 32 Channels of Signals
- Five Input SIUs
  - 120 Channels of Detection

▶ **Full 32 Channel CMU function:**

- Configured with the parameters from the actual intersection CMU Datakey
- Broad fault coverage to confirm CU compatibility

▶ **Multiple configurations of ATC5301 cabinets are supported:**

- Standard Input Assembly (24 or 48 channel)
  - Up to five SIUs for 120 Input channels
- Standard 16 Channel Output Assembly
- Standard 32 Channel Output Assembly
- Combo IO Assembly (McCain Backpack)
- NYCDOT LPLVC
- More to come

# *Cabinet Device Emulation (TS-2)*

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The software emulates the functionality of the NEMA TS2 input/output Bus Interface Units (BIU) and the Malfunction Management Unit (MMU2)

▶ **Up to eight BIUs are supported:**

- Four T&F Output SIUs
  - 16 Channels of Signals
- Four Input BIUs
  - 64 Channels of Detection

▶ **Full 16 Channel MMU2 function:**

- NEMA TS2 FYA Modes A:H
- Broad fault coverage to confirm CU compatibility

- ▶ All NEMA Standard Input and Output configurations are supported
- ▶ The MMU2 function supports Flashing Yellow Arrow configuration A thru H

# *Cabinet Device Emulation (TEES 332)*

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The software emulates the functionality of the TEES 2070 input/output Field IO Module (FIO) and the 2018KCL CMU

▶ **2070 FIO emulation:**

- 64 Outputs
  - 18 Channels of Signals
- 64 Inputs
  - 64 Channels of Detection

▶ **Full 18 Channel CMU function:**

- FYA Modes Standard and Compact
- 2018KCL Broad fault coverage to confirm CU compatibility

- ▶ All TEES Standard Input and Output configurations are supported
- ▶ The CMU function supports Flashing Yellow Arrow and is configured with a Datakey or Datakey file.
- ▶ Aux File is supported for 18 channel operation



# *Cabinet Device Emulation (ITS Cabinet)*

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The software emulates the functionality of the ITS Cabinet input/output Serial Interface Units (SIU) and the Cabinet Monitor Unit (CMU212)

▶ **Up to seven SIUs are supported:**

- Two Output SIUs
  - 28 Channels of Signals
- Five Input SIUs
  - 120 Channels of Detection

▶ **Full 32 Channel CMU function:**

- Configured with the parameters from the actual intersection CMU Datakey
- CMU212 Broad fault coverage to confirm CU compatibility

▶ **Multiple configurations of ITS Cabinets are supported:**

- Standard Input Assembly
  - Up to five SIUs for 120 Input channels
- Output Assemblies
  - 14 Pack for 14 Channels
  - 14 Pack + 6 Pack for 20 channels
  - 14 Pack + 14 Pack for 28 channels

# *Software Functionality*

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The *ATC CyberCabinet*® software is intersection project based and provides two operating modes:

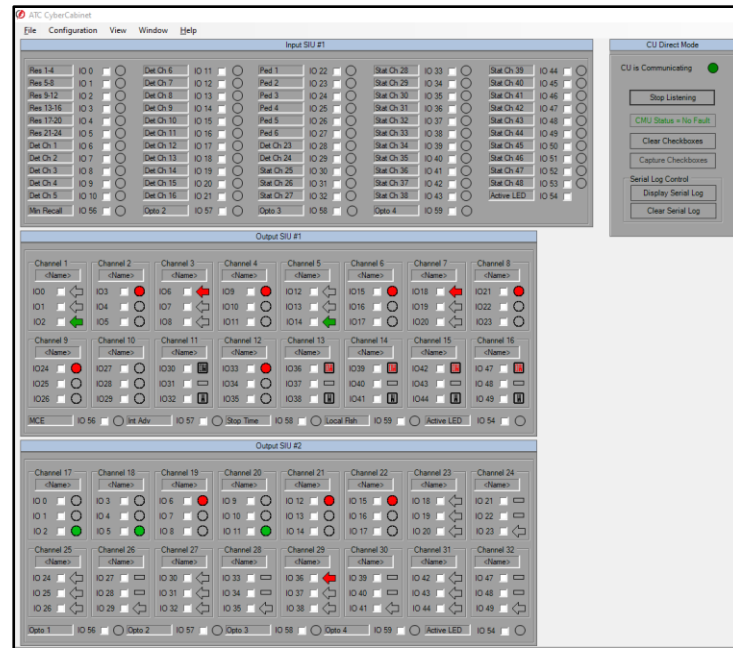
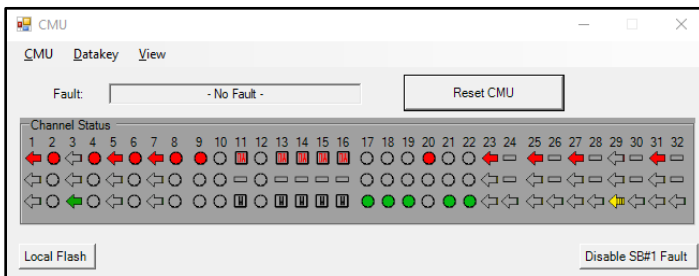
## *Device View* and *Map View*

- ▶ The *Device View* is a more hardware centric view of the cabinet devices, and provides direct access to individual SIU inputs and outputs.
- ▶ The *Map View* elevates above the device level to an overhead view of the intersection, and uses active icons for detection inputs and signal outputs.



# CU Direct – Device View

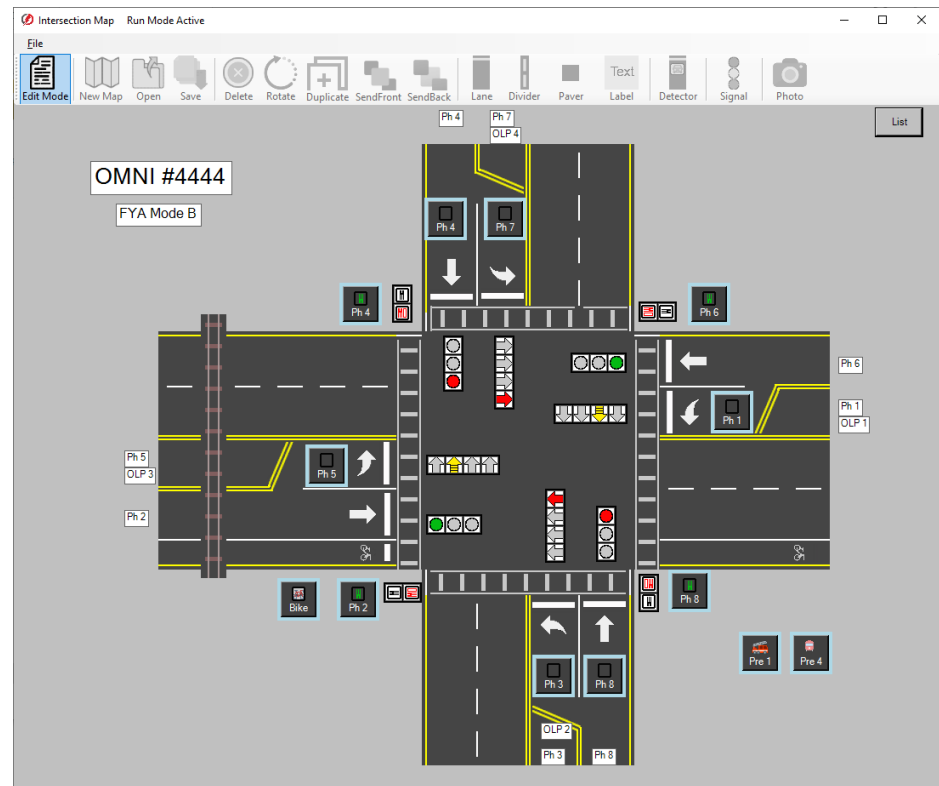
The target CU is the only physical device, the cabinet CMU and SIU devices are all virtualized.



Signal icons are customizable to reflect the type of movement:  
Thru Ball, Protected Turns, FYA, Ped, etc.

# CU Direct – Map View

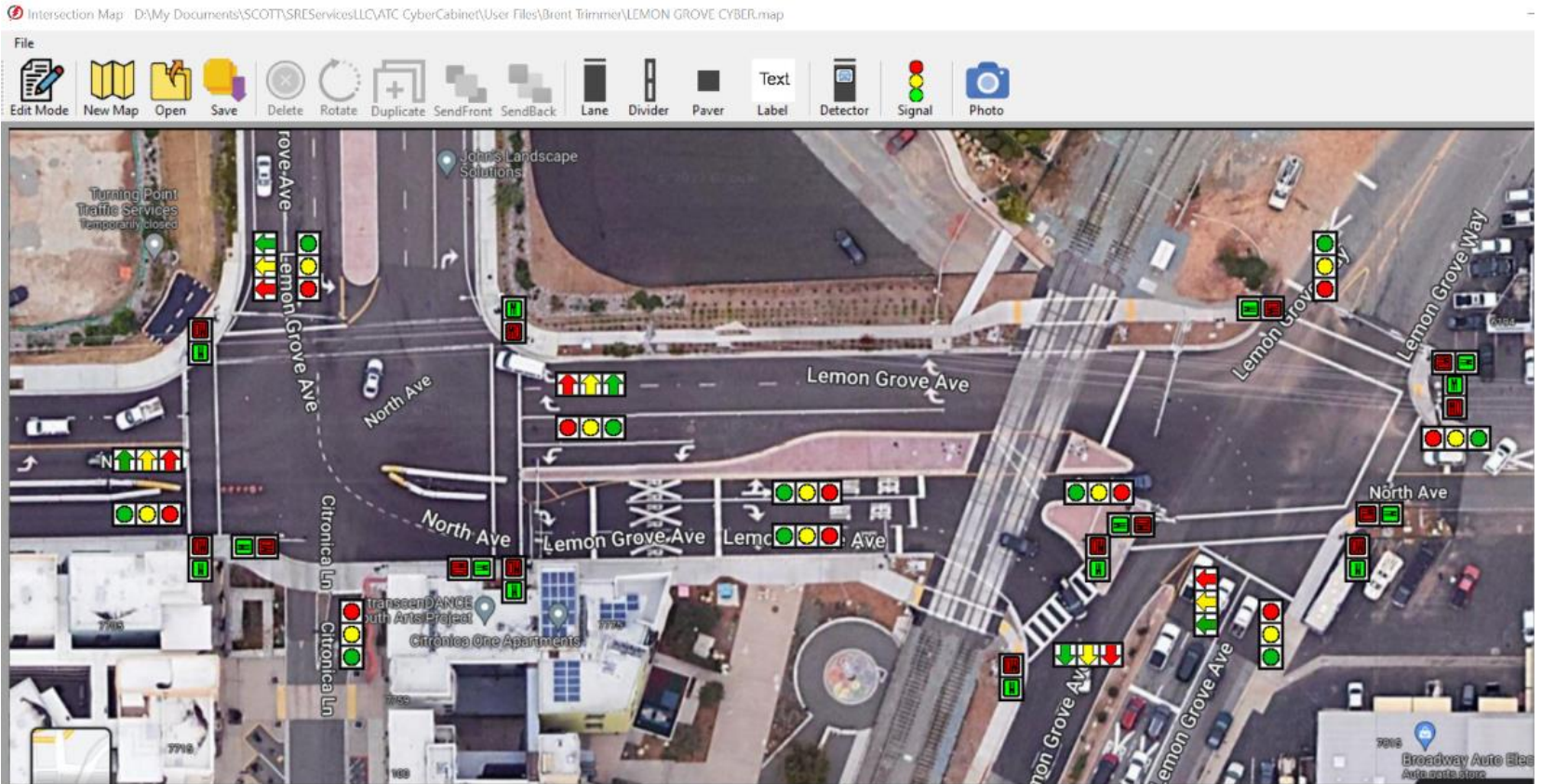
- ▶ A built-in Editor is used to develop an icon based overhead view of the target intersection.
- ▶ Control icons provide clickable actions for Detector inputs, Ped buttons, and Preemption.
- ▶ Traffic signal icons reflect the CU signal outputs.



Screen view of an 8-phase FYA quad map

# CU Direct – Map View

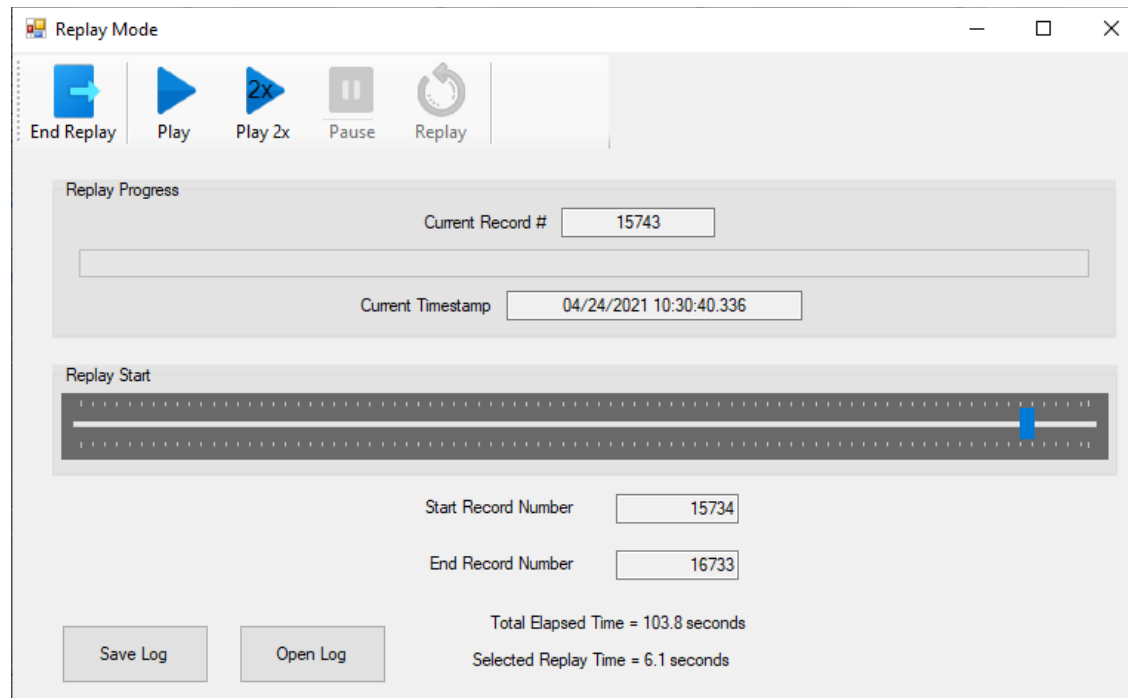
Intersection photo backgrounds are also supported.





# Replay Mode

- ▶ **Capture and Replay a controller sequence** such as a preemption routine or CMU fault to examine for more detailed analysis.



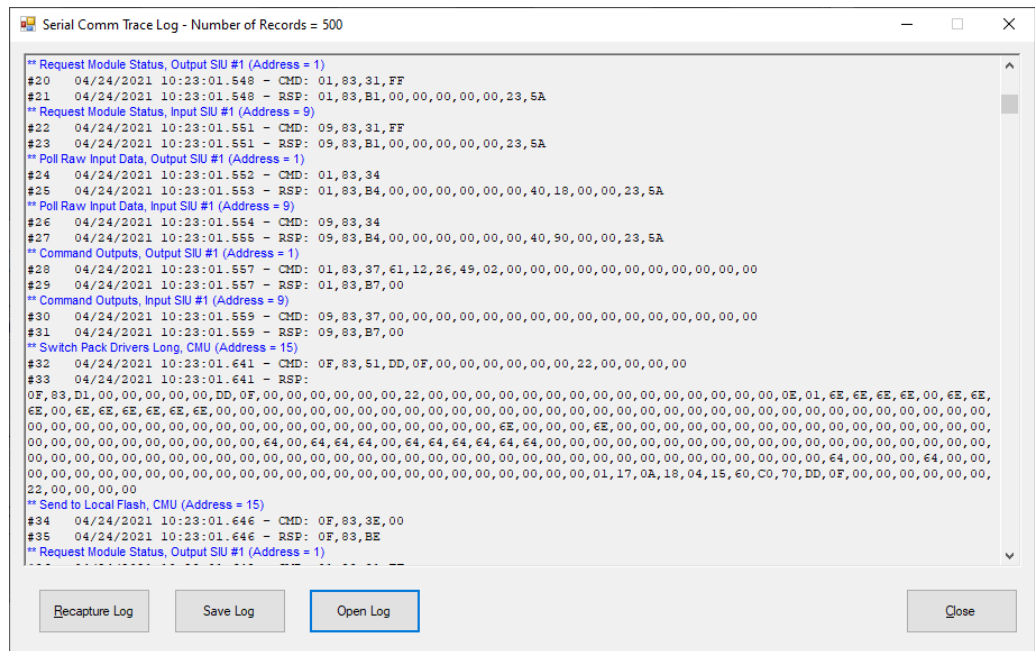


# Serial Comm Trace Log

A Serial Bus #1 Recording function (sniffer) is provided to inspect Controller command frame sequencing

Did a preemption sequence not operate correctly?  
*Go back and review what the Controller actually sent to the SIUs.*

Trace Log & Replay capture is manually triggered or can be triggered by a CMU fault.



# *Cabinet Monitor Unit (CMU)*

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A 32 Channel Cabinet Monitor Unit function is provided in the *CU Direct* mode.

- ▶ Test and validate the CMU Configuration using the exact Datakey configuration for the target cabinet during Controller test & evaluation.
- ▶ Test Preemption sequences and complex movements for CMU compatibility.
- ▶ Datakey parameters can be read from a Key file on disk, or directly from the EDI *MonitorKey*® Programmer.

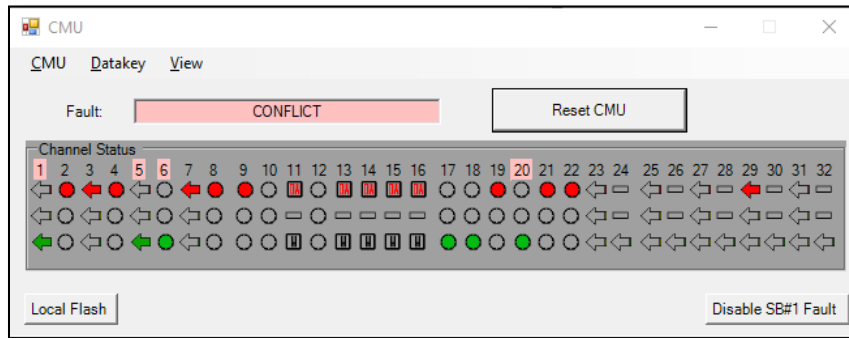
*Eliminate CMU surprises when the physical cabinet is installed on the street.*



*MonitorKey*® is a trademark of Eberle Design Inc.

# CMU Functions

The CMU function provides the following fault coverage:

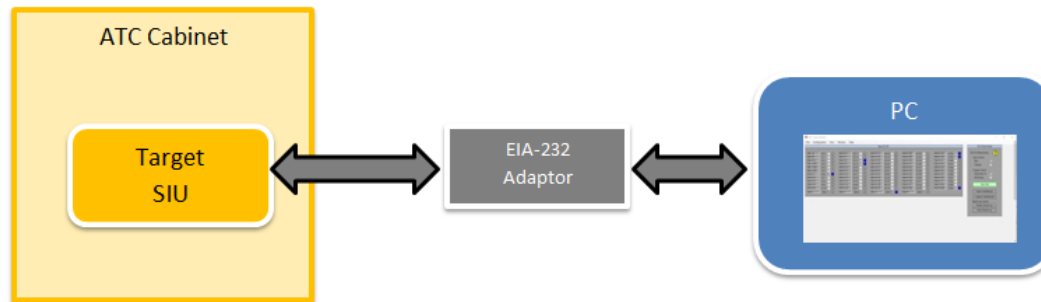


- ▶ Conflict
- ▶ Lack of Signal (LOS)
  - Dark Maps
- ▶ Multiple Signal
- ▶ Clearance
  - Minimum Yellow
  - Minimum Yellow Plus Red
- ▶ Flashing Yellow Arrow
  - FYA Flash Rate
  - R&Y Input Enable
- ▶ Virtual Channels
- ▶ Serial Bus #1 Timeout
- ▶ Local Flash

# SIU Direct Mode

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*SIU Direct* mode is used to communicate directly to a hardware SIU-2218 installed in a physical ATC cabinet.

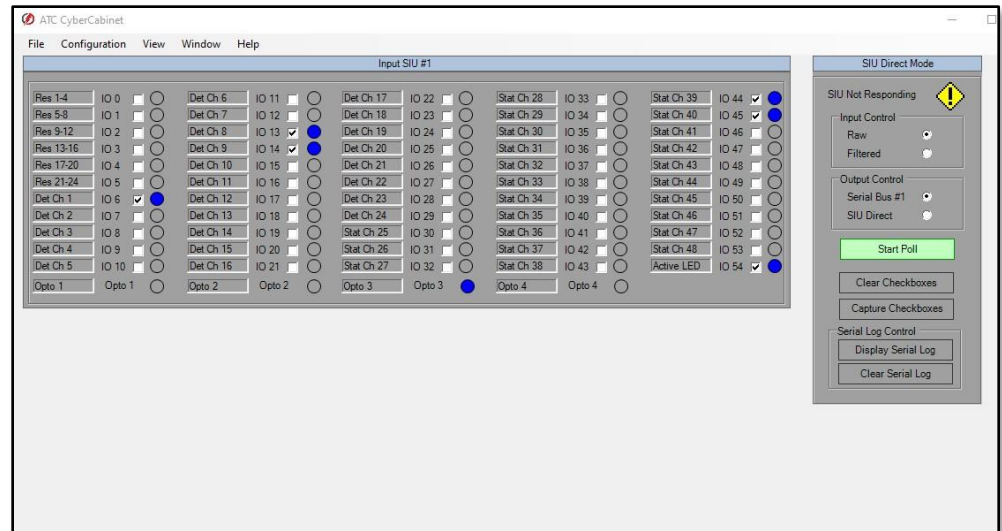


The *SIU Direct* mode can be helpful to :

- ▶ Trouble shoot problems with a suspect SIU-2218 or assembly.
- ▶ Exercise or test an Input or Output Assembly directly without a CU installed.

# SIU Direct Mode

- ▶ With the SIU IO form controls, a user can monitor the SIU IO responses to CU commands.
- ▶ The Output Control mode will bypass CU SB#1 commands and set the inputs and outputs of the target SIU-2218 directly from the manual *SIU Direct* form controls.



Screen view of the *SIU Direct* mode connected to Input SIU #1

# *ATC CyberCabinet Software*

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- ▶ Test & Validate CU databases without the need for a fully populated hardware ATC Cabinet.
- ▶ Test & Validate the actual CMU Configuration programmed into the cabinet CMU Datakey.

*Future-Proof your ATC Controller  
Development and Test program.*



Contact your local ATC Cabinet supplier for more information about the *ATC CyberCabinet*® product.