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ATC CABINETS

EMPOWER: 2023 Channel Partner Summit

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Matt Zinn

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AGENDA

- Low Voltage ATC Cabinet Update
- ATC Cabinets
  - Enhancements
  - Models + Configurations
- Solar ATC Cabinet
- ATC CyberCabinet® Software
- ATC Cabinet Progression + Landscape

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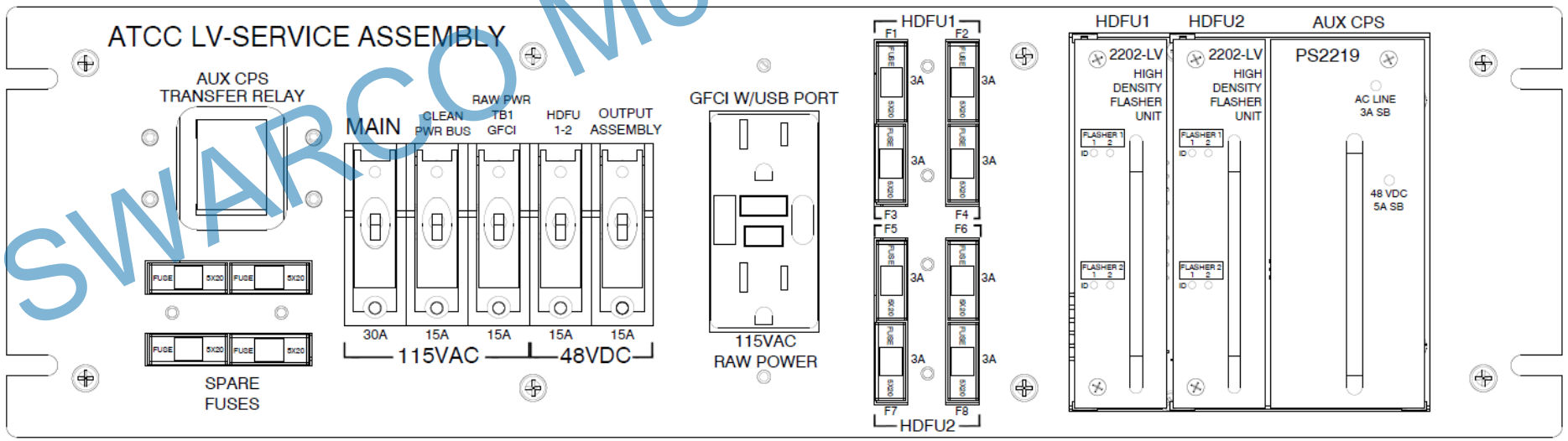
LOW-VOLTAGE ATC CABINET UPDATE

REZA ROOZITALAB, P.E. + SCOTT EVANS

LOW-VOLTAGE ATC CABINET UPDATE

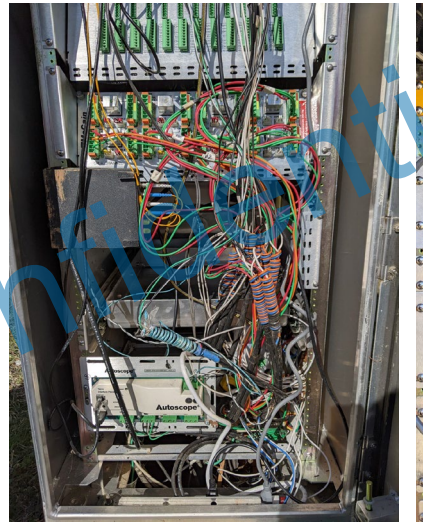
LOW-VOLTAGE ATC CABINET AUXILIARY / BACK UP CABINET POWER SUPPLY

- In any cabinet (i.e., NEMA, Caltrans, ITS & HV ATC cabinet), when the Cabinet Power Supply (CPS) goes down, the intersection goes to flash mode and not a Dark Mode. In the HV configuration cabinet flashers and signal heads are being powered by 120VAC Utility and not by the CPS.
- If a LV configured cabinet if the CPS goes down, the respective intersection will go Dark. In the HV configuration Cabinet flashers and signal heads are being powered by CPS 48VDC.
- Having a Dark intersection during Flash Mode is a concern and lowers reliability and popularity of LV ATC Cabinet.
- To reduce this risk, we have designed an Auxiliary / Back up CPS that can be activated if the main CPS fails, thus maintaining the intersection in Flash Mode.



LOW-VOLTAGE ATC CABINET UPDATE

- White paper by Kennesaw State University Research & Service Foundation.
- This project performed an empirical study of our low-voltage (LV) ATC Cabinet in a field environment (Cobb County, Georgia). It aimed to quantify the energy (primarily) and safety (secondarily) advantages of the LV ATC Cabinet when compared to a conventional (GDOT 332) cabinet. Considerations of an LV ATC Cabinet deployment were also briefly investigated with respect to Personal Protective Equipment (PPE) requirements and costs for maintenance purposes, as well as technician, motorist, and pedestrian safety.
- It was found that the LV ATC Cabinet configuration consumed 17.9% less energy than the model 332 configuration.
- Copy of the white paper has been uploaded to the USBs provided to you.



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ATC CABINET ENHANCEMENTS

REZA ROOZITALAB, P.E., MIGUEL RODRIGUEZ, + MATT ZINN

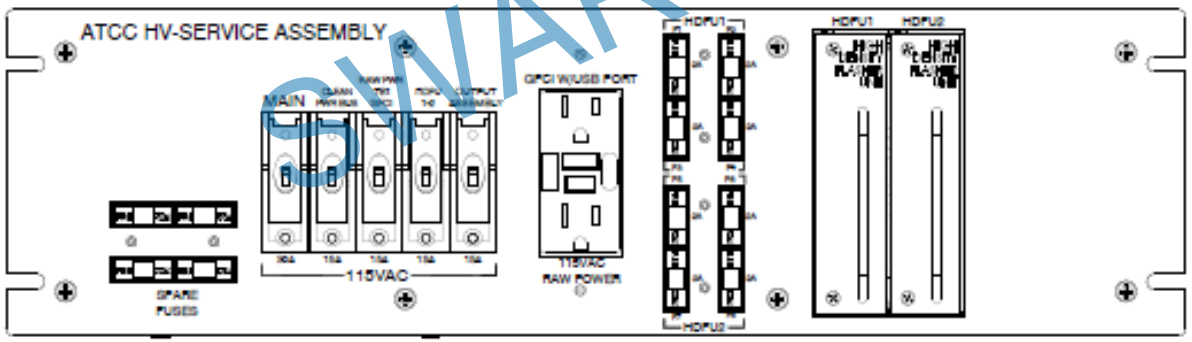
IMPROVEMENTS + ENHANCEMENTS
OUTPUT ASSEMBLY (OA)

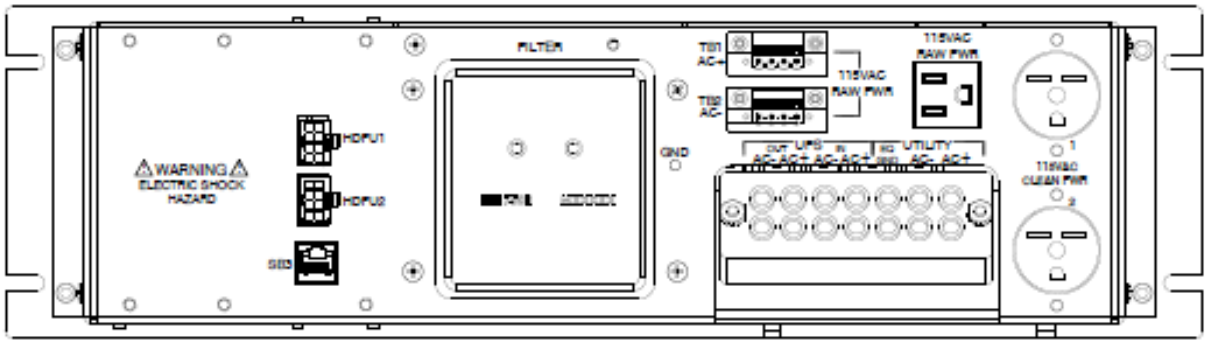
- Eliminate bank of four 5-Amp CBs (circuit breaker) of 16-CH or eight 5-Amp CBs of 32-CH OA. Instead, use only one CB and call it Signal CB to comply with Standard
  - One purpose of the CB bank was in troubleshooting to identify a short. CMU can handle this task.
  - ATC Cabinet deployments have shown the quad CB bank was not offering effective protection
  - Eliminating CB bank creates space for other items
- Relocate the “Main Contactor (MC)” from the OA rear to better access for viewing, measuring or replacing.
  - Make it easier to access to MC for technicians.

IMPROVEMENTS + ENHANCEMENTS

SERVICE ASSEMBLY (SA)

- The default SA will be horizontal and mounts across EIA rails
  - This horizontal SA will improve ATC Cabinet space efficiency
  - The horizontal SA will have a better access and much easier to land utility power wires
- It will be equipped with two HDFU openings
- It will be equipped with an AC- terminal
- The SA GFCI will be 15A rated and equipped with USB charging port
- The SA Filter (suppressor) will be compact
- The SA offers extra fuse holders to house 4 spare HDFU fuses
- In addition, the SA for Low Voltage ATC Cabinet will be equipped with an optional Aux CPS (Cabinet Power Supply) to power the HDFU(s) and signal when main CPS or UPS/BBS goes down





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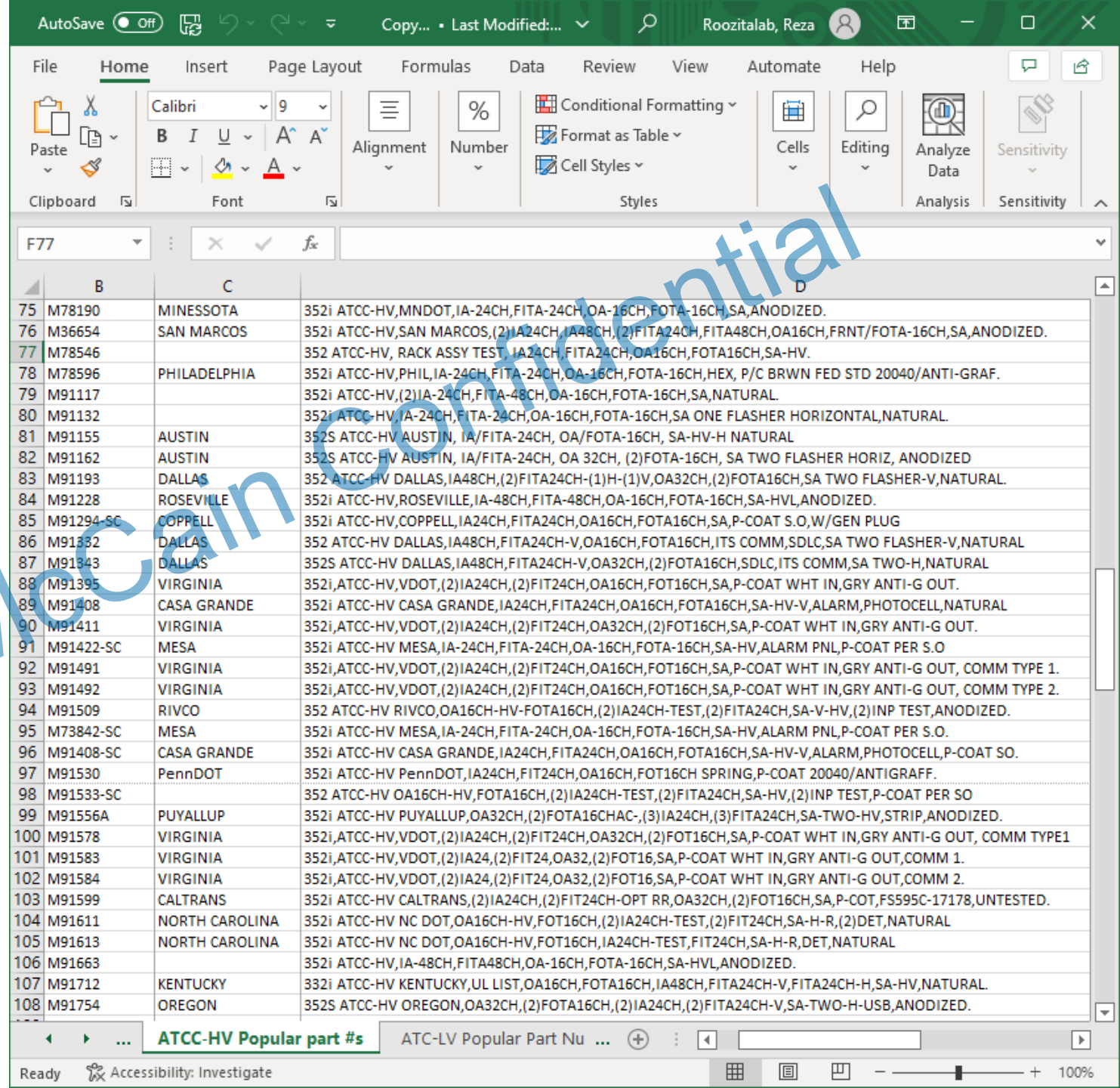
ATC CABINET MODELS + CONFIGURATIONS

REZA ROOZITALAB, P.E. + MIGUEL RODRIGUEZ

MODELS + CONFIGURATIONS

ATC CABINET OFFERINGS

- 10 major models
- 200 sub models and configurations



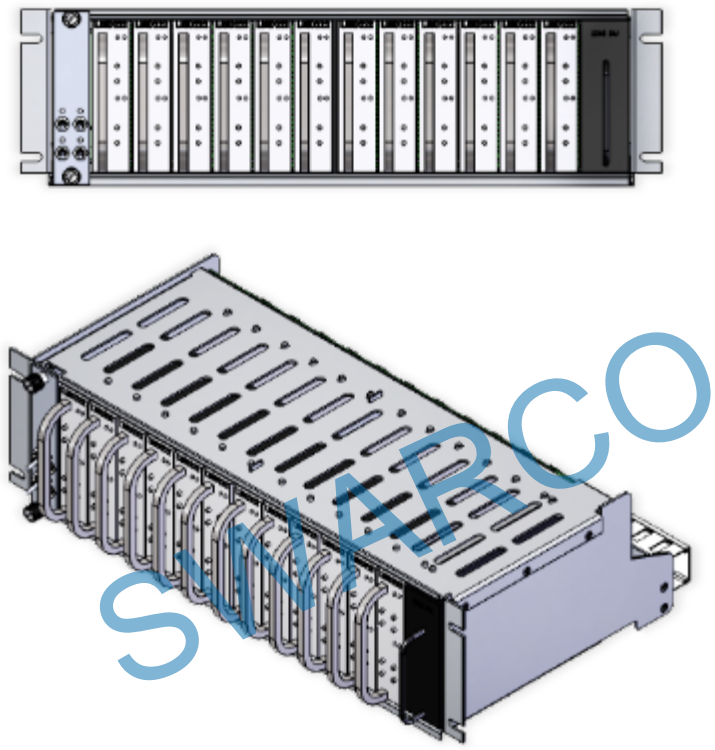
	B	C	D
75	M78190	MINESSOTA	352i ATCC-HV,MNDOT,IA-24CH,FITA-24CH,OA-16CH,FOTA-16CH,SA,ANODIZED.
76	M36654	SAN MARCOS	352i ATCC-HV,SAN MARCOS,(2)IA24CH,IA48CH,(2)FITA24CH,FITA48CH,OA16CH,FRNT/FOTA-16CH,SA,ANODIZED.
77	M78546		352 ATCC-HV, RACK ASSY TEST, IA24CH,FITA24CH,OA16CH,FOTA16CH,SA-HV.
78	M78596	PHILADELPHIA	352i ATCC-HV,PHIL,IA-24CH,FITA-24CH,OA-16CH,FOTA-16CH,HEX, P/C BRWN FED STD 20040/ANTI-GRAF.
79	M91117		352i ATCC-HV,(2)IA-24CH,FITA-48CH,OA-16CH,FOTA-16CH,SA,NATURAL.
80	M91132		352i ATCC-HV,IA-24CH,FITA-24CH,OA-16CH,FOTA-16CH,SA ONE FLASHER HORIZONTAL,NATURAL.
81	M91155	AUSTIN	352S ATCC-HV AUSTIN, IA/FITA-24CH, OA/FOTA-16CH, SA-HV-H NATURAL
82	M91162	AUSTIN	352S ATCC-HV AUSTIN, IA/FITA-24CH, OA 32CH, (2)FOTA-16CH, SA TWO FLASHER HORIZ, ANODIZED
83	M91193	DALLAS	352 ATCC-HV DALLAS,IA48CH,(2)FITA24CH-(1)H-(1)V,OA32CH,(2)FOTA16CH,SA TWO FLASHER-V,NATURAL.
84	M91228	ROSEVILLE	352i ATCC-HV,ROSEVILLE,IA-48CH,FITA-48CH,OA-16CH,FOTA-16CH,SA-HVL,ANODIZED.
85	M91294-SC	COPPELL	352i ATCC-HV,COPPELL,IA24CH,FITA24CH,OA16CH,FOTA16CH,SA,P-COAT S.O,W/GEN PLUG
86	M91332	DALLAS	352 ATCC-HV DALLAS,IA48CH,FITA24CH-V,OA16CH,FOTA16CH,ITS COMM,SDLC,SA TWO FLASHER-V,NATURAL
87	M91343	DALLAS	352S ATCC-HV DALLAS,IA48CH,FITA24CH-V,OA32CH,(2)FOTA16CH,SDLC,ITS COMM,SA TWO-H,NATURAL
88	M91395	VIRGINIA	352i,ATCC-HV,VDOT,(2)IA24CH,(2)FIT24CH,OA16CH,FOT16CH,SA,P-COAT WHT IN,GRY ANTI-G OUT.
89	M91408	CASA GRANDE	352i ATCC-HV CASA GRANDE,IA24CH,FITA24CH,OA16CH,FOTA16CH,SA-HV-V,ALARM,PHOTOCELL,NATURAL
90	M91411	VIRGINIA	352i,ATCC-HV,VDOT,(2)IA24CH,(2)FIT24CH,OA32CH,(2)FOT16CH,SA,P-COAT WHT IN,GRY ANTI-G OUT.
91	M91422-SC	MESA	352i ATCC-HV MESA,IA-24CH,FITA-24CH,OA-16CH,FOTA-16CH,SA-HV,ALARM PNL,P-COAT PER S.O
92	M91491	VIRGINIA	352i,ATCC-HV,VDOT,(2)IA24CH,(2)FIT24CH,OA16CH,FOT16CH,SA,P-COAT WHT IN,GRY ANTI-G OUT, COMM TYPE 1.
93	M91492	VIRGINIA	352i,ATCC-HV,VDOT,(2)IA24CH,(2)FIT24CH,OA16CH,FOT16CH,SA,P-COAT WHT IN,GRY ANTI-G OUT, COMM TYPE 2.
94	M91509	RIVCO	352 ATCC-HV RIVCO,OA16CH-HV-FOTA16CH,(2)IA24CH-TEST,(2)FITA24CH,SA-V-HV,(2)INP TEST,ANODIZED.
95	M73842-SC	MESA	352i ATCC-HV MESA,IA-24CH,FITA-24CH,OA-16CH,FOTA-16CH,SA-HV,ALARM PNL,P-COAT PER S.O.
96	M91408-SC	CASA GRANDE	352i ATCC-HV CASA GRANDE,IA24CH,FITA24CH,OA16CH,FOTA16CH,SA-HV-V,ALARM,PHOTOCELL,P-COAT SO.
97	M91530	PennDOT	352i ATCC-HV PennDOT,IA24CH,FIT24CH,OA16CH,FOT16CH SPRING,P-COAT 20040/ANTIGRAFF.
98	M91533-SC		352 ATCC-HV OA16CH-HV,FOTA16CH,(2)IA24CH-TEST,(2)FITA24CH,SA-HV,(2)INP TEST,P-COAT PER SO
99	M91556A	PUYALLUP	352i ATCC-HV PUYALLUP,OA32CH,(2)FOTA16CHAC-,(3)IA24CH,(3)FITA24CH,SA-TWO-HV,STRIP,ANODIZED.
100	M91578	VIRGINIA	352i,ATCC-HV,VDOT,(2)IA24CH,(2)FIT24CH,OA32CH,(2)FOT16CH,SA,P-COAT WHT IN,GRY ANTI-G OUT, COMM TYPE1
101	M91583	VIRGINIA	352i,ATCC-HV,VDOT,(2)IA24,(2)FIT24,OA32,(2)FOT16,SA,P-COAT WHT IN,GRY ANTI-G OUT,COMM 1.
102	M91584	VIRGINIA	352i,ATCC-HV,VDOT,(2)IA24,(2)FIT24,OA32,(2)FOT16,SA,P-COAT WHT IN,GRY ANTI-G OUT,COMM 2.
103	M91599	CALTRANS	352i ATCC-HV CALTRANS,(2)IA24CH,(2)FIT24CH-OPT RR,OA32CH,(2)FOT16CH,SA,P-COT,FS595C-17178,UNTESTED.
104	M91611	NORTH CAROLINA	352i ATCC-HV NC DOT,OA16CH-HV,FOT16CH,(2)IA24CH-TEST,(2)FIT24CH,SA-H-R,(2)DET,NATURAL
105	M91613	NORTH CAROLINA	352i ATCC-HV NC DOT,OA16CH-HV,FOT16CH,IA24CH-TEST,FIT24CH,SA-H-R,DET,NATURAL
106	M91663		352i ATCC-HV,IA-48CH,FITA48CH,OA-16CH,FOTA-16CH,SA-HVL,ANODIZED.
107	M91712	KENTUCKY	332i ATCC-HV KENTUCKY,UL LIST,OA16CH,FOTA16CH,IA48CH,FITA24CH-V,FITA24CH-H,SA-HV,NATURAL.
108	M91754	OREGON	352S ATCC-HV OREGON,OA32CH,(2)FOTA16CH,(2)IA24CH,(2)FITA24CH-V,SA-TWO-H-USB,ANODIZED.

MODELS + CONFIGURATIONS

THE LINEUP

MODELS + CONFIGURATIONS
INPUT ASSEMBLY

24 Channel - 1 SIU, twelve 2-channel slots (M54487)



48 Channel - 2 SIUs, twelve 4-channel slots (M58379)

MODELS + CONFIGURATIONS

FITA: FIELD INPUT TERMINATION ASSEMBLY (DEFAULT)

- Horizontal 24 Channel (M58661)
- Rackmount form factor
- Phoenix connectors for field wiring
- 2 isolated pairs per input channel
- Surge arrestors plug in above the input channels

MODELS + CONFIGURATIONS

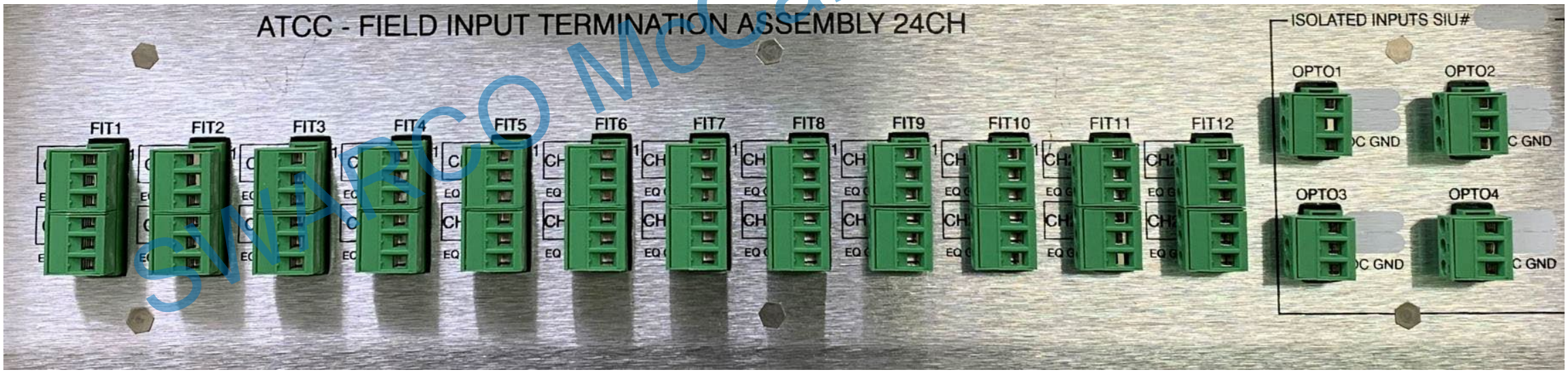
FITA: FIELD INPUT TERMINATION ASSEMBLY

- Horizontal 24 Channel (M91728)
- Rackmount form factor – low profile
- Phoenix connectors for field wiring
- 2 isolated pairs per input channel
- Surge arrestors plug behind the input channels
- Terminal for landing Opto. 1-4 inputs

MODELS + CONFIGURATIONS

FITA: FIELD INPUT TERMINATION ASSEMBLY

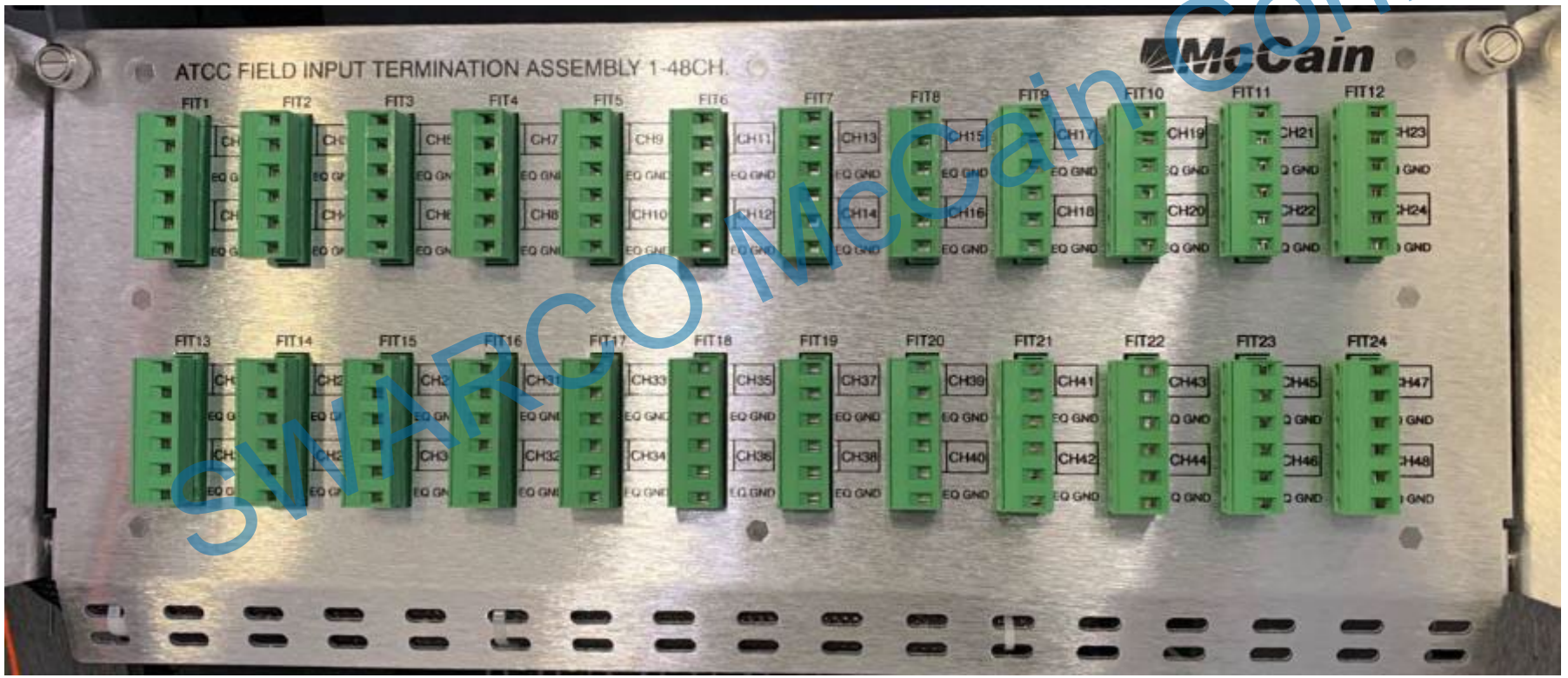
- Horizontal 24 Channel (M91549A)
- Rackmount form factor – low profile
- Phoenix connectors for field wiring
- 2 connector plugs per input channel
- Surge arrestors plug in above the input channels
- Terminal for landing SIU Opto. 1-4 inputs



MODELS + CONFIGURATIONS

FITA: FIELD INPUT TERMINATION ASSEMBLY

- Horizontal 48 Channel (M76490)
- Rackmount form factor
- Phoenix 6-position connector plugs for field wiring



MODELS + CONFIGURATIONS

FITA: FIELD INPUT TERMINATION ASSEMBLY (DEFAULT)

- Panel mounted 24 Channel (M54489)
- Original design for ATCC
- Screw terminals for field wiring
- Surge arrestors plug in the center of the panel

MODELS + CONFIGURATIONS

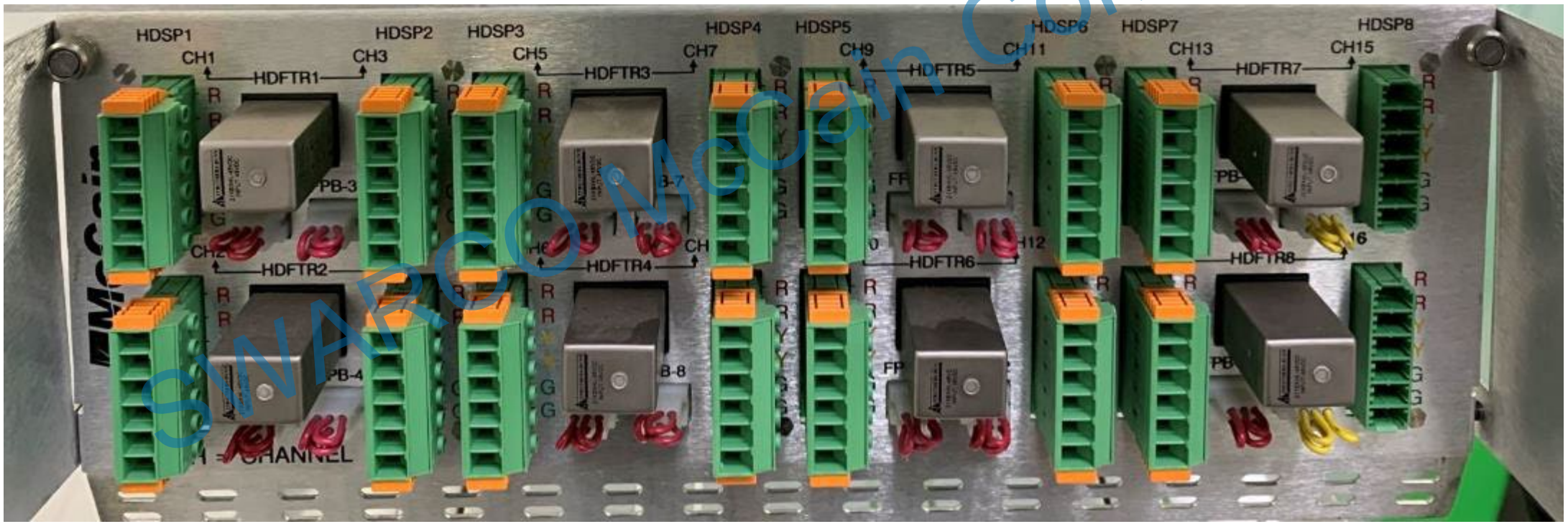
OUTPUT ASSEMBLY - 16 AND 32 CHANNEL CONFIGURATIONS

- 16 Channel assembly (M52213)
  - Up to 8 high density switch packs
  - One CMU-2212
  - One 2218 SIU
  - 4 HDSP circuit breakers
- 32 Channel assembly (M52379)
  - Up to 16 high density switch packs
  - One CMU-2212
  - Two 2218 SIU
  - 8 HDSP circuit breakers
- Common to both:
  - Stop Time switch
  - Auto/Flash switch
  - 24vdc bypass button
  - 4 opto isolated inputs for Police panel routed into SIU #1

MODELS + CONFIGURATIONS

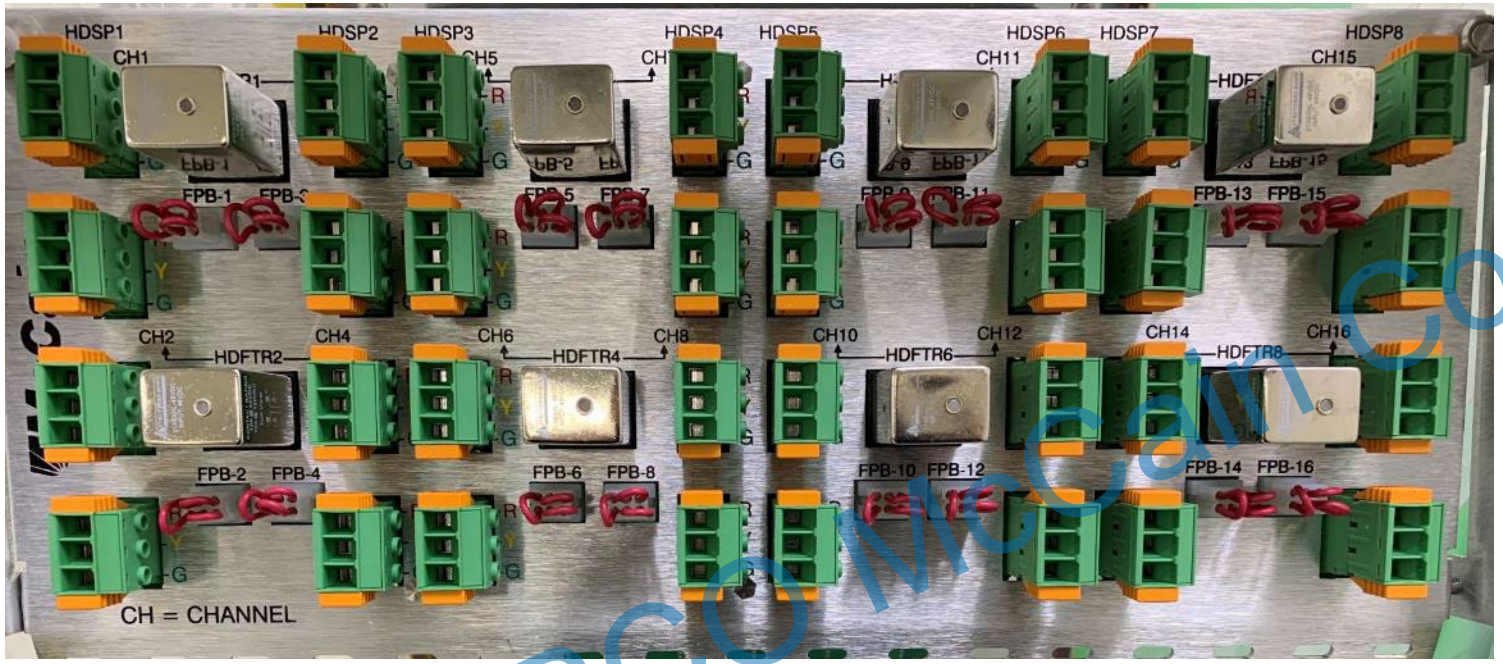
FOTA: FIELD OUTPUT TERMINATION ASSEMBLY (DEFAULT)

- Field wiring typically terminated in Phoenix connector (M58641)
- HD flash transfer relays
- Flash program blocks
- Output surge arrestors



MODELS + CONFIGURATIONS

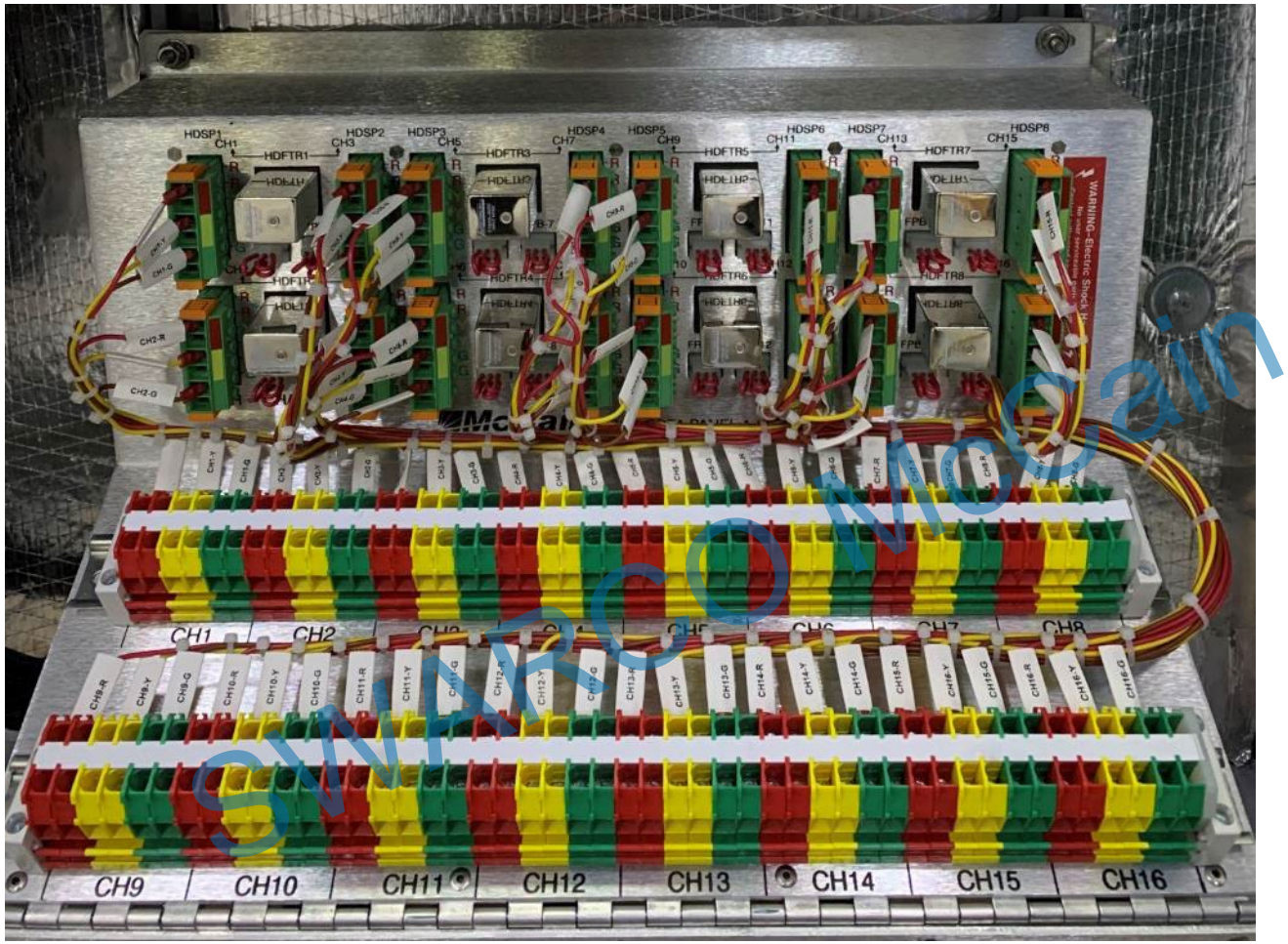
FOTA: FIELD OUTPUT TERMINATION ASSEMBLY



- 16 CHANNEL (M91644)
- Field wiring typically terminated in Phoenix connector
- HD flash transfer relays
- Flash program blocks
- Output surge arrestors
- 2 connector plugs per output channel

MODELS AND CONFIGURATIONS

FOTA: FIELD OUTPUT TERMINATION ASSEMBLY WITH EXTENSION PANEL



- 16 Channel (M59874)
- Load bay style
- Phoenix 6-position connectors for field wiring w/ additional NEMA type term blocks class 9080 (type GRC)

MODELS AND CONFIGURATIONS

FOTA: FIELD OUTPUT TERMINATION ASSEMBLY WITH FUSE PANEL ASSEMBLY

- Horizontal 16 Channel (M76370-front & M76370-2)
- Rackmount form factor
- Phoenix 6-position connectors for field wiring with additional fused term blocks

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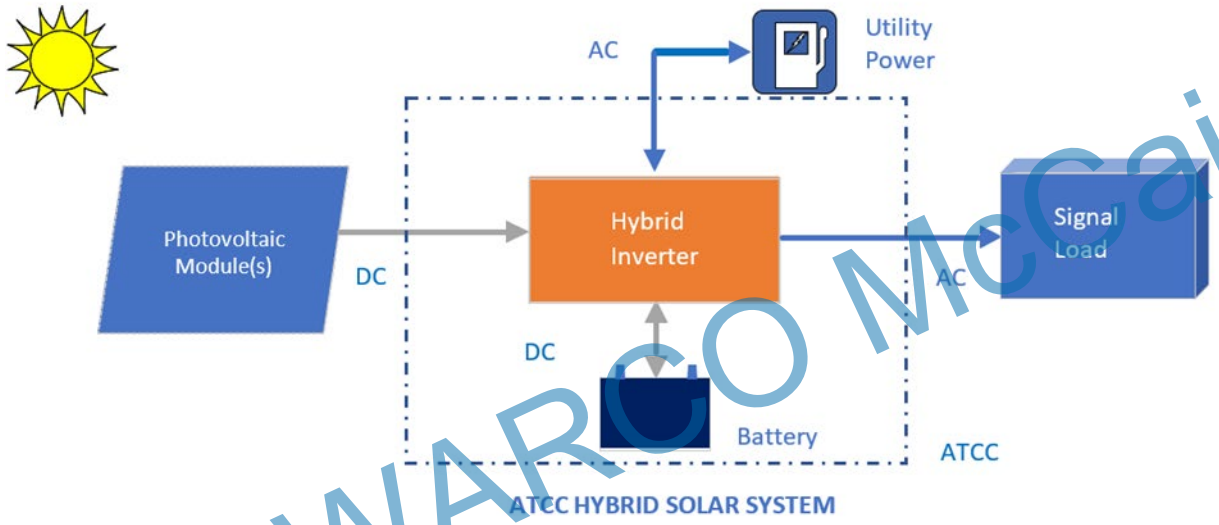
SOLAR ATC CABINET

HERASMO INIGUEZ, P.E.

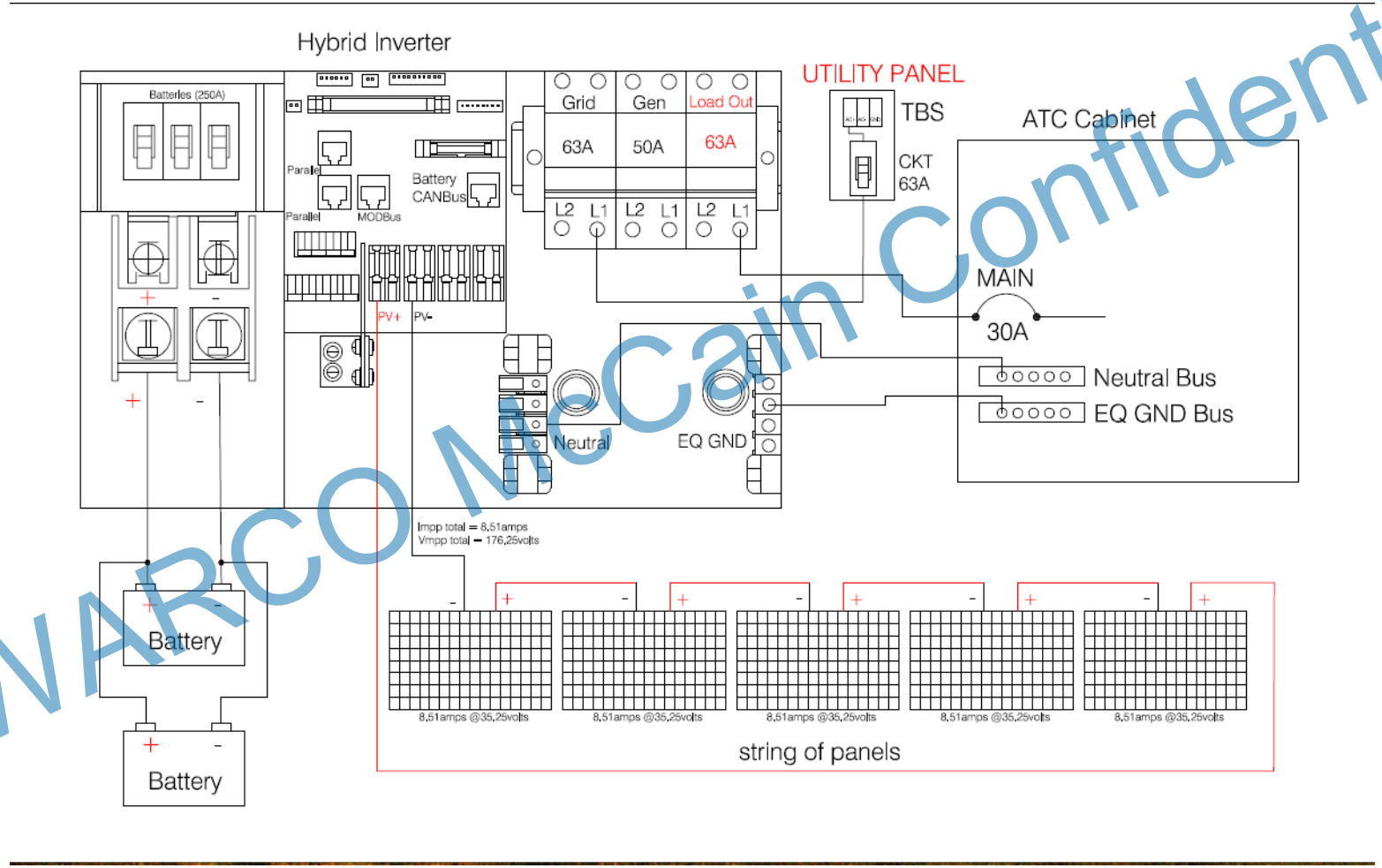
SOLAR ATC CABINET
INTEGRATED SOLAR SYSTEM AND ATCC

High Level Design



SOLAR ATC CABINET

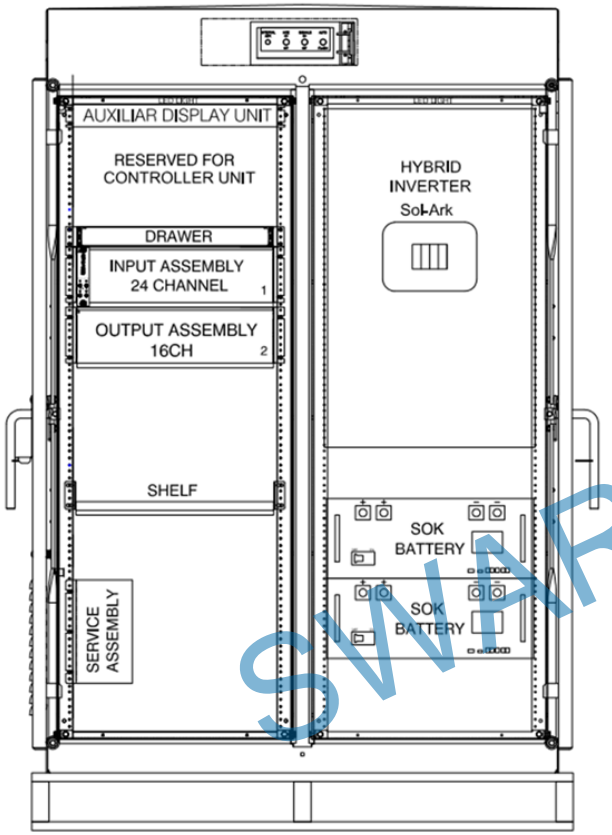
ATCC HYBRID SOLAR SYSTEM DIAGRAM



SOLAR ATC CABINET

TYPICAL SOLAR SYSTEM CONFIGURATION

Model 350i ATC Cabinet



Intersection Load

- 300-Watt load Intersection
- 10K Wh Battery Bank Capacity
- 2.4K Watt Solar Panel Array
- Single Model 350i ATC Cabinet

SOLAR ATC CABINET
HYBRID INVERTER

Hybrid Inverter (Integrated Inverter and charge controller)

- This inverter has two charge controller.

Inverter capacity

- Solar Output Power 12000 Watts
- AC output power 9000 Watts
- Battery output power 9000 Watts
- Two MPPT Charge Controllers
- LiFePO4 Battery type
- Max DC current per MPPT 20A@300V, 18A@400V
- Dimensions (LxWxH): 29.47”x18.3”x10”

SOLAR ATC CABINET
LIFEP04 BATTERIES

Lithium Iron Phosphate (LiFeP04) Batteries
Non-Explosive and safe for intersections

Battery Capacity

- Battery operating Voltage 48V DC
- Rated Power 200Ah
- Efficiency 99%
- 8000 Cycles Life Span
- Rack Mount design
- Energy 5,120Wh
- Dimensions (LxWxH): 17.4”x18”x6.96”

SOLAR ATC CABINET
SOLAR PANELS

Q-CELLS Monocrystalline Cells Panels

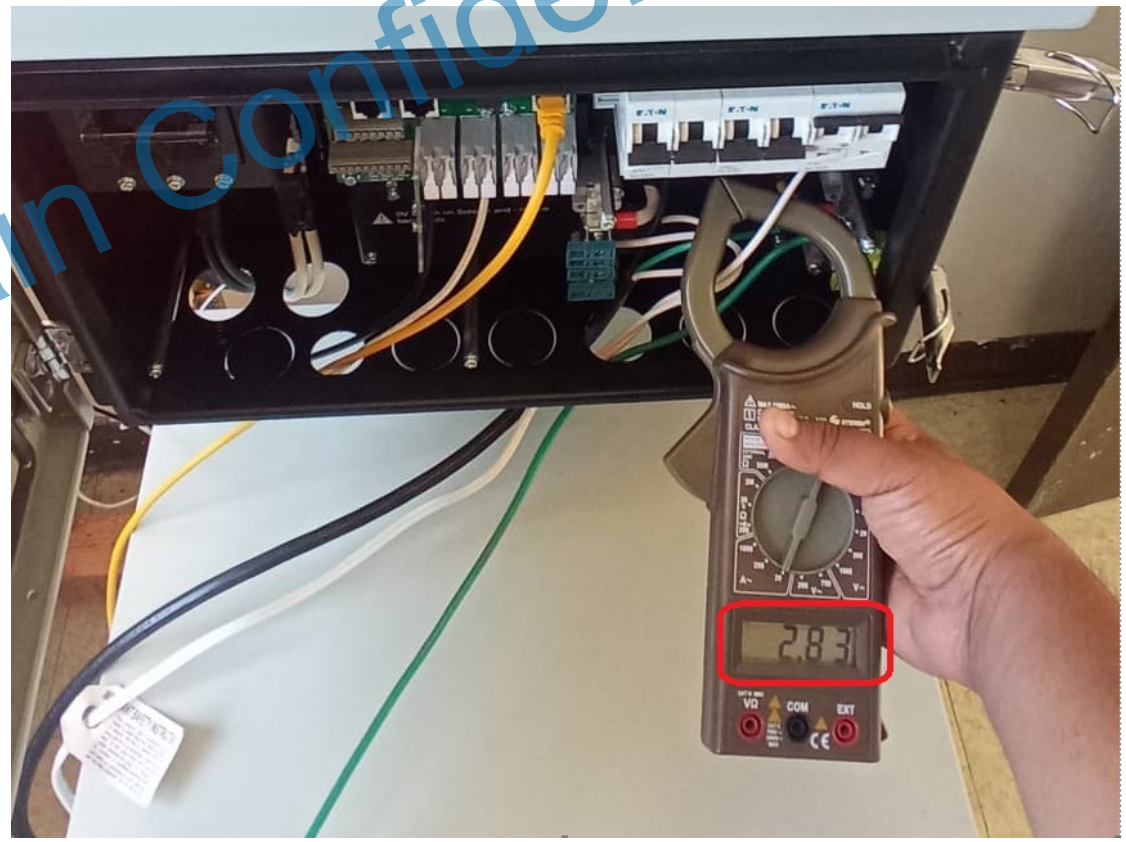
Solar Panel Capacity

- 400 Watts per panel
- Nominal 48V DC Standard Output
- 6x26 Monocrystalline Cells
- Dimensions (LxWxH): 86.9”x40.82”x1.38”

SOLAR ATC CABINET
SOLAR SYSTEM IN OPERATION

Hybrid Inverter shows 260 watts

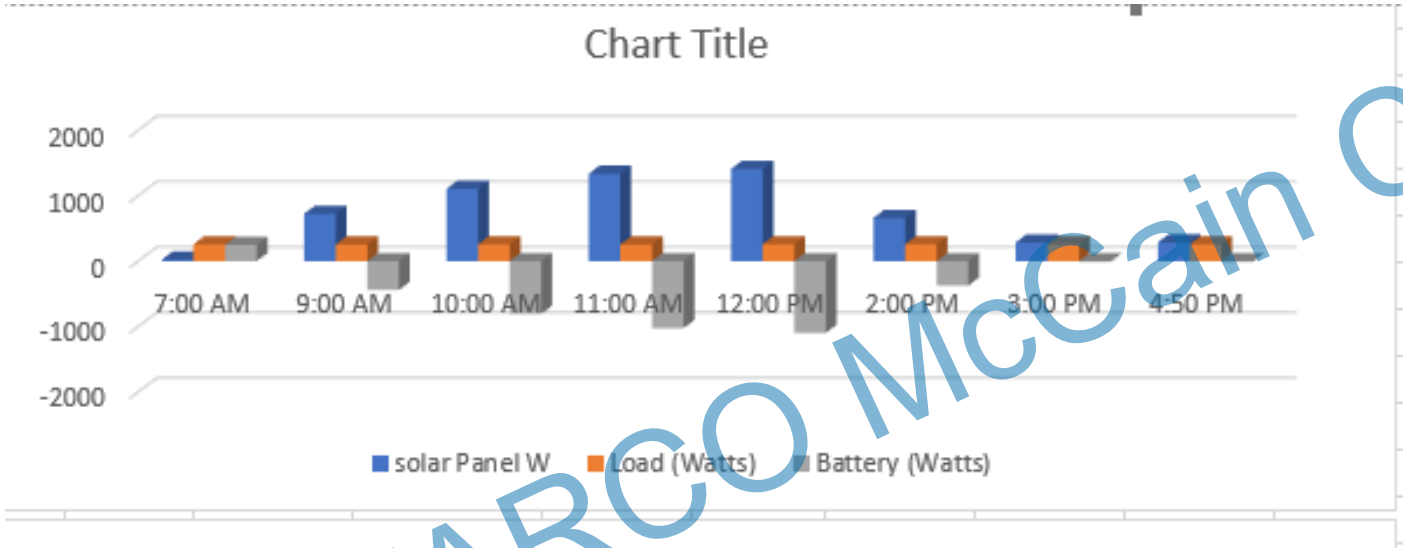
Using an amp-meter we have 2.83 amps on AC (336 watts AC)



SOLAR ATC CABINET

SOLAR SYSTEM IN OPERATION

- Negative means the batteries are being charged by the solar panels.

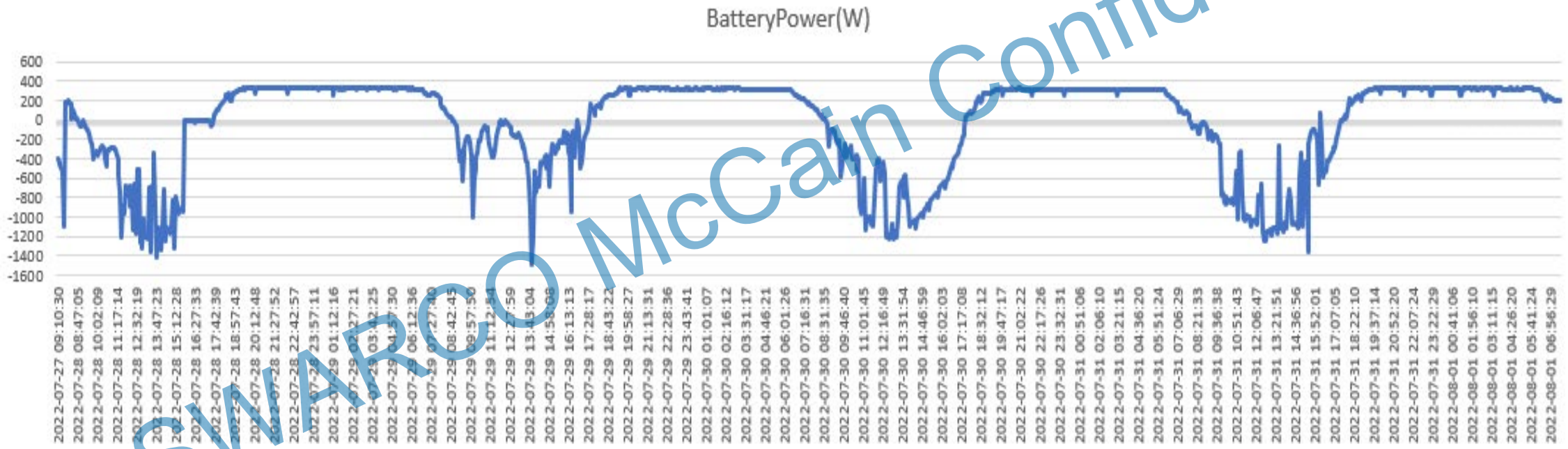


Thursday	solar Panel W	Load (Watts)	Battery (Watts)
7:00 AM	23	258	248
9:00 AM	724	256	-439
10:00 AM	1106	257	-805
11:00 AM	1337	256	-1024
12:00 PM	1411	259	-1094
2:00 PM	660	257	-373
3:00 PM	286	257	-8
4:50 PM	290	257	-8

SOLAR ATC CABINET

SOLAR SYSTEM IN OPERATION

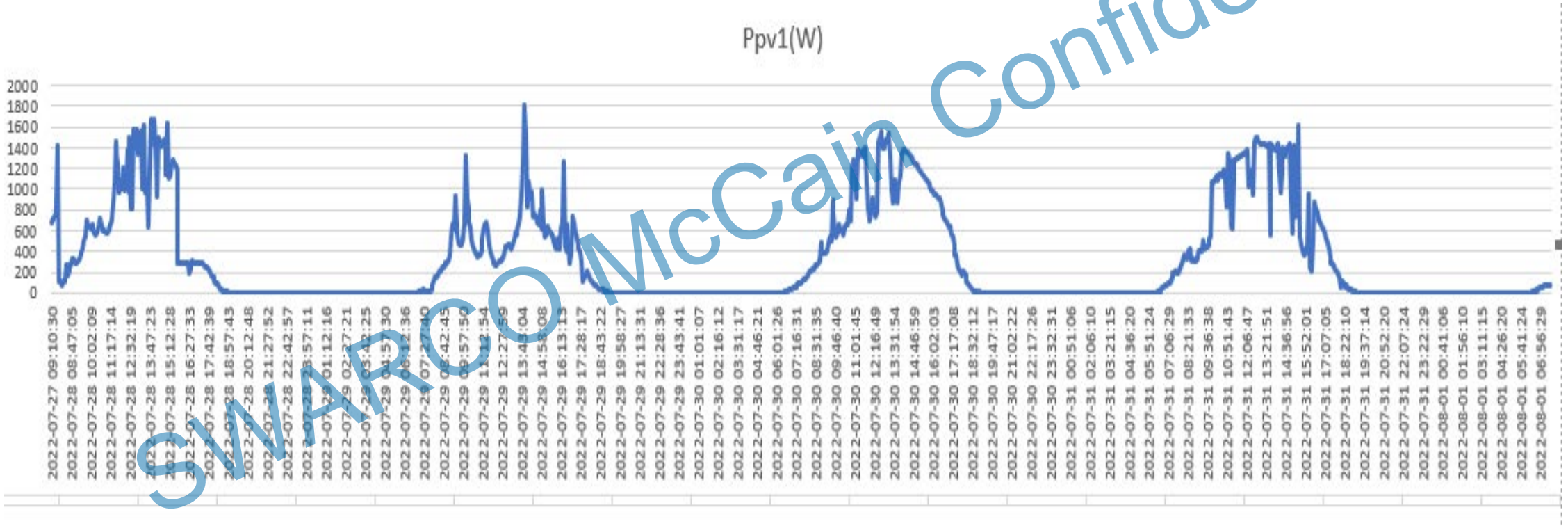
- Battery Energy Production



SOLAR ATC CABINET

SOLAR SYSTEM IN OPERATION

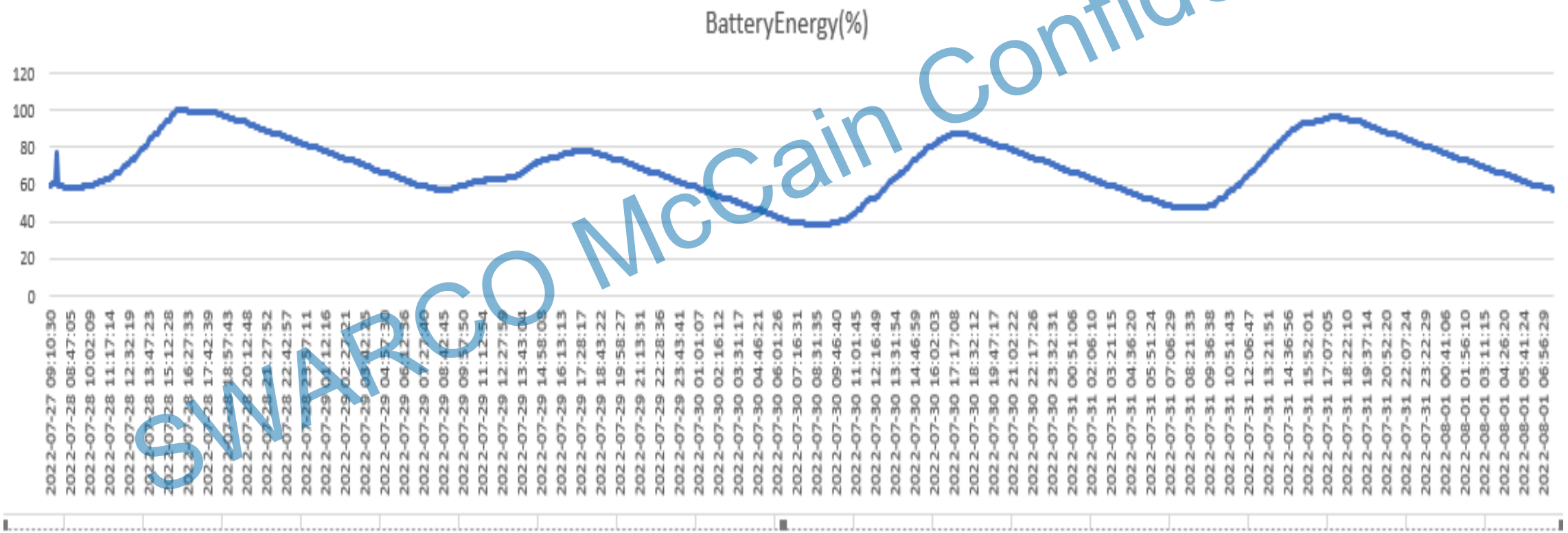
- Solar panel energy production



SOLAR ATC CABINET

SOLAR SYSTEM IN OPERATION

- Battery Bank Capacity (Two Batteries)



SOLAR ATC CABINET

SOLAR SYSTEM IN OPERATION

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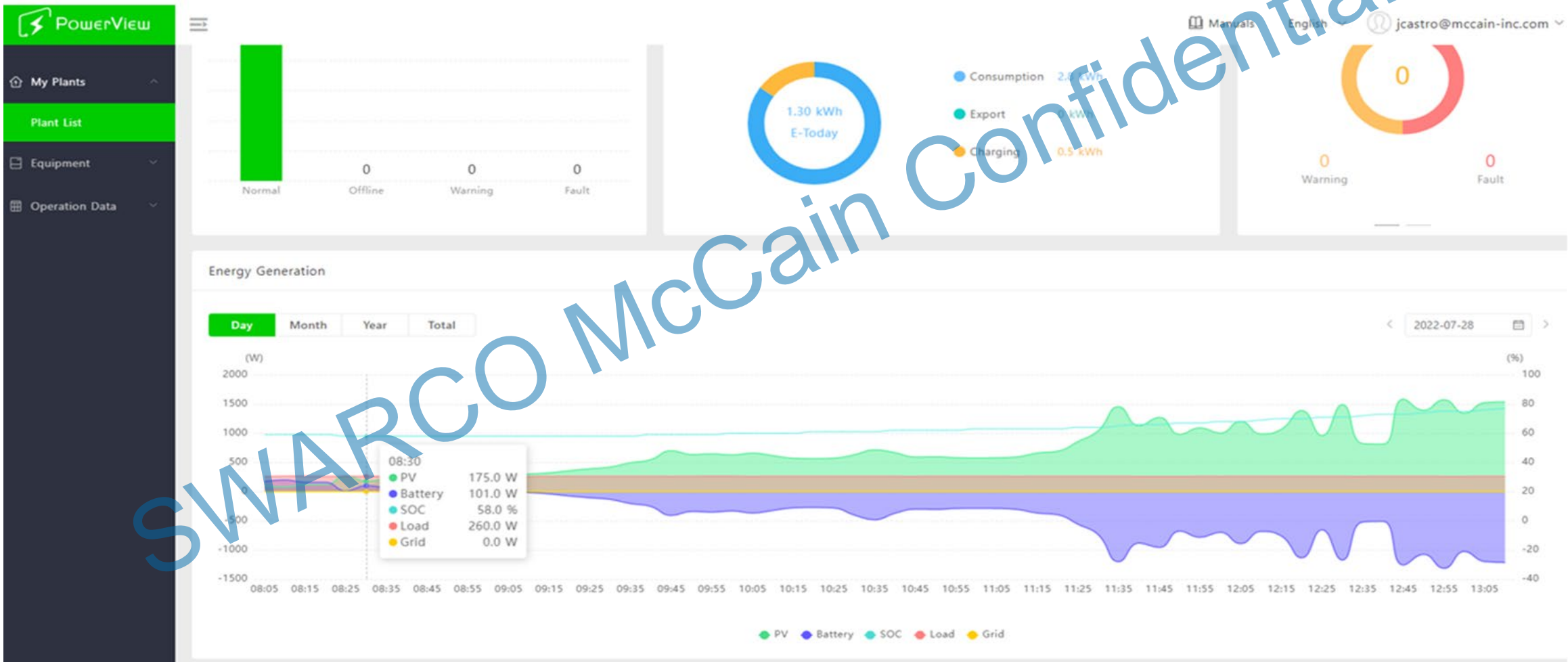
SOLAR SYSTEM IN OPERATION



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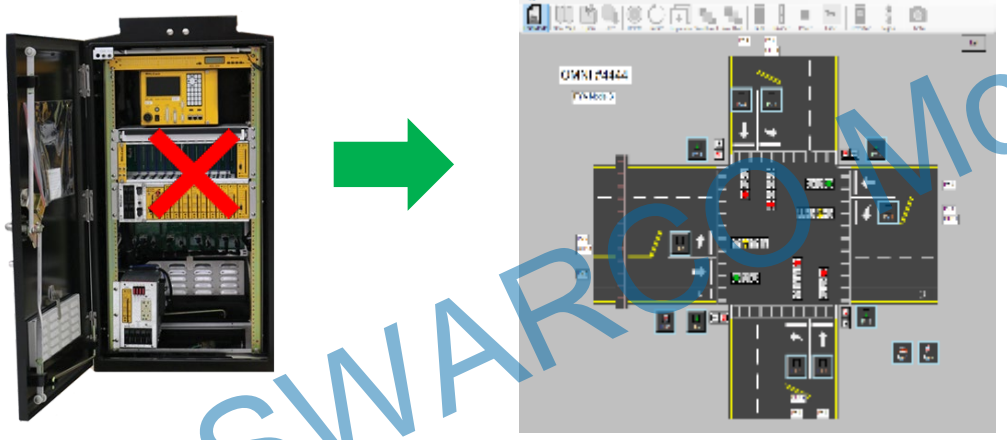
ATC CYBERCABINET® SOFTWARE

SCOTT EVANS

ATC CYBERCABINET® SOFTWARE

For Traffic Engineers and Technicians, it is often a challenge to test and validate Controller programs and visualize the results.

The ATC CyberCabinet® program provides an Engineer with a software-based solution to test and validate the functionality of an ATC Controller Unit (CU) database operating with the actual CMU/MMU2 configuration, without needing a full ATC5301, NEMA TS2, or TEES 332 Cabinet Assembly in hardware.



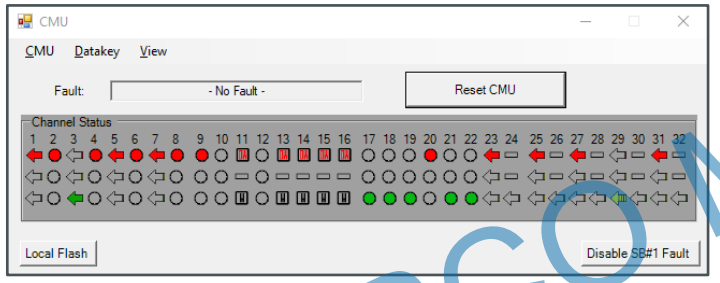
- Test & Validate CU databases without the need for a fully populated hardware ATC Cabinet.
- Test & Validate the actual CMU/MMU2 Configuration programmed into the cabinet monitor.
- SWARCO McCain exclusive distributed product.
- Further details at http://www.sreservicesllc.com/

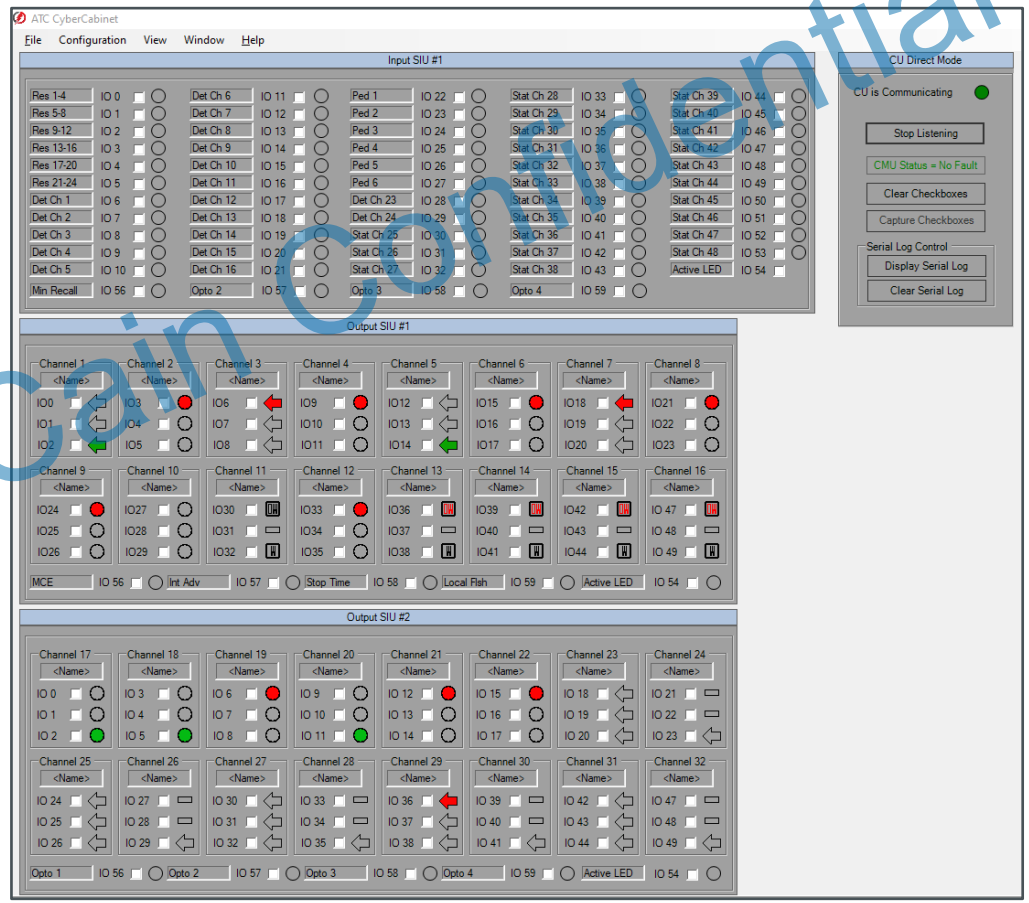
Future-Proof your ATC Controller Development, Test, and Training programs.

ATC CYBERCABINET® SOFTWARE

CyberCabinet DEVICE View

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





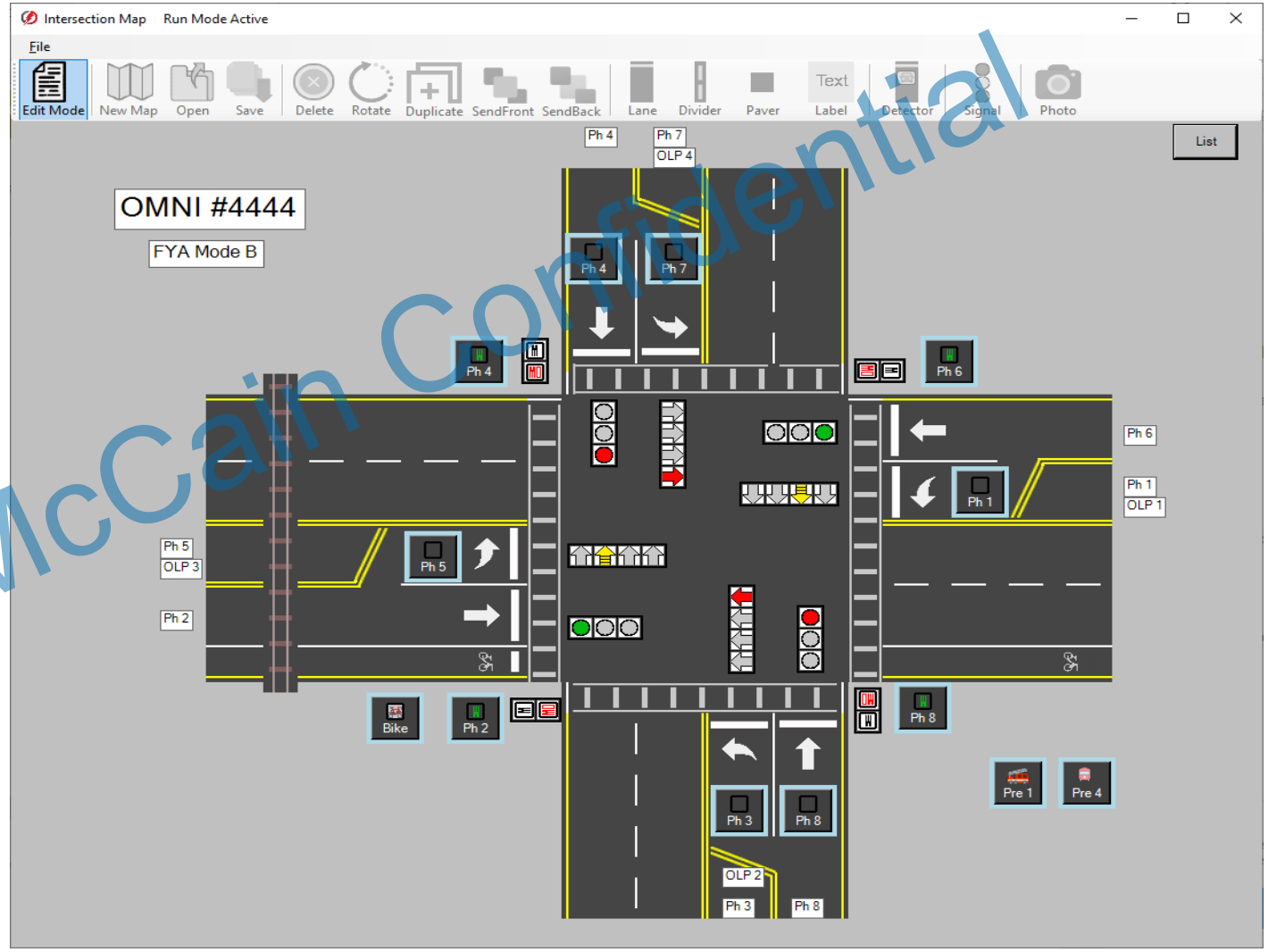
Signal icons are customizable to reflect the type of movement:

- Thru Ball, Protected Turns, FYA, Ped, etc.

ATC CYBERCABINET® SOFTWARE

CyberCabinet 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 and beacon icons reflect the CU signal outputs.
- Intersection photo backgrounds are also supported.



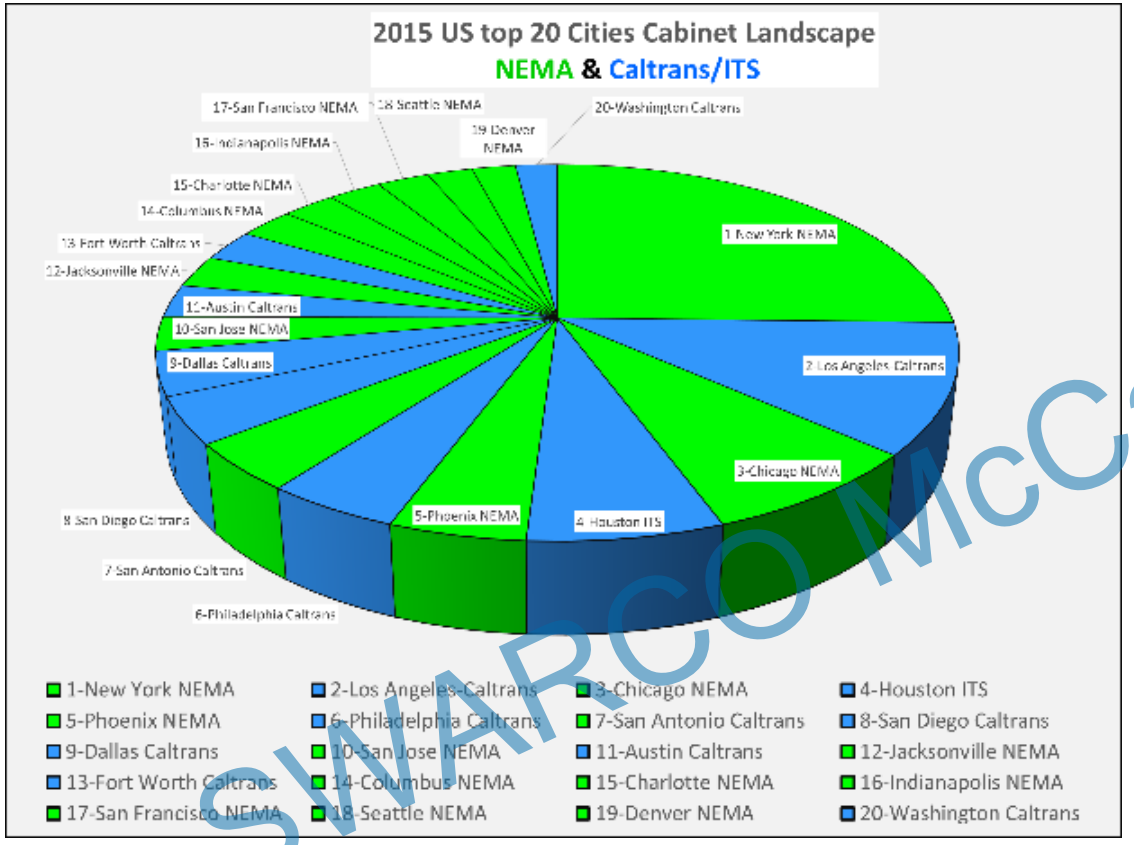
Screen view of an 8-phase FYA quad map

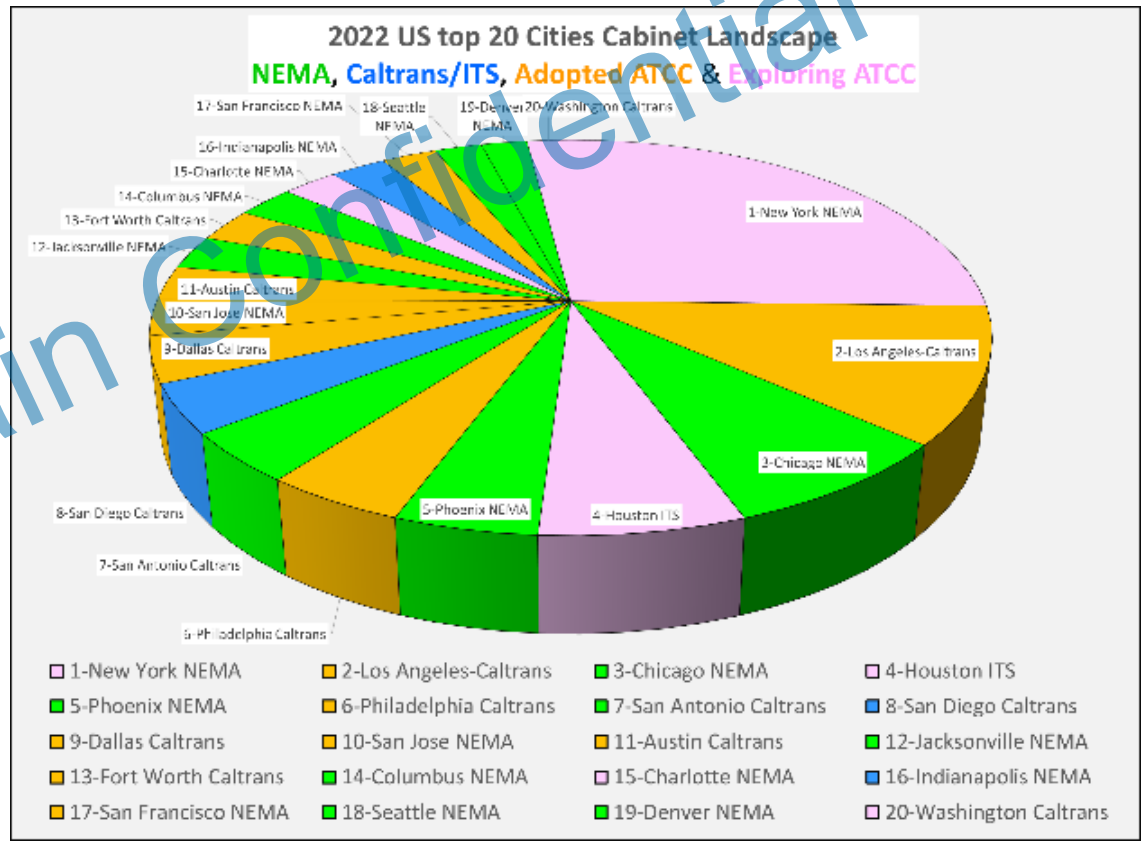
The Better Way. Every Day.

ATC PROGRESSION + LANDSCAPE

NATHAN WELCH

ATC CABINET PROGRESSION & LANDSCAPE





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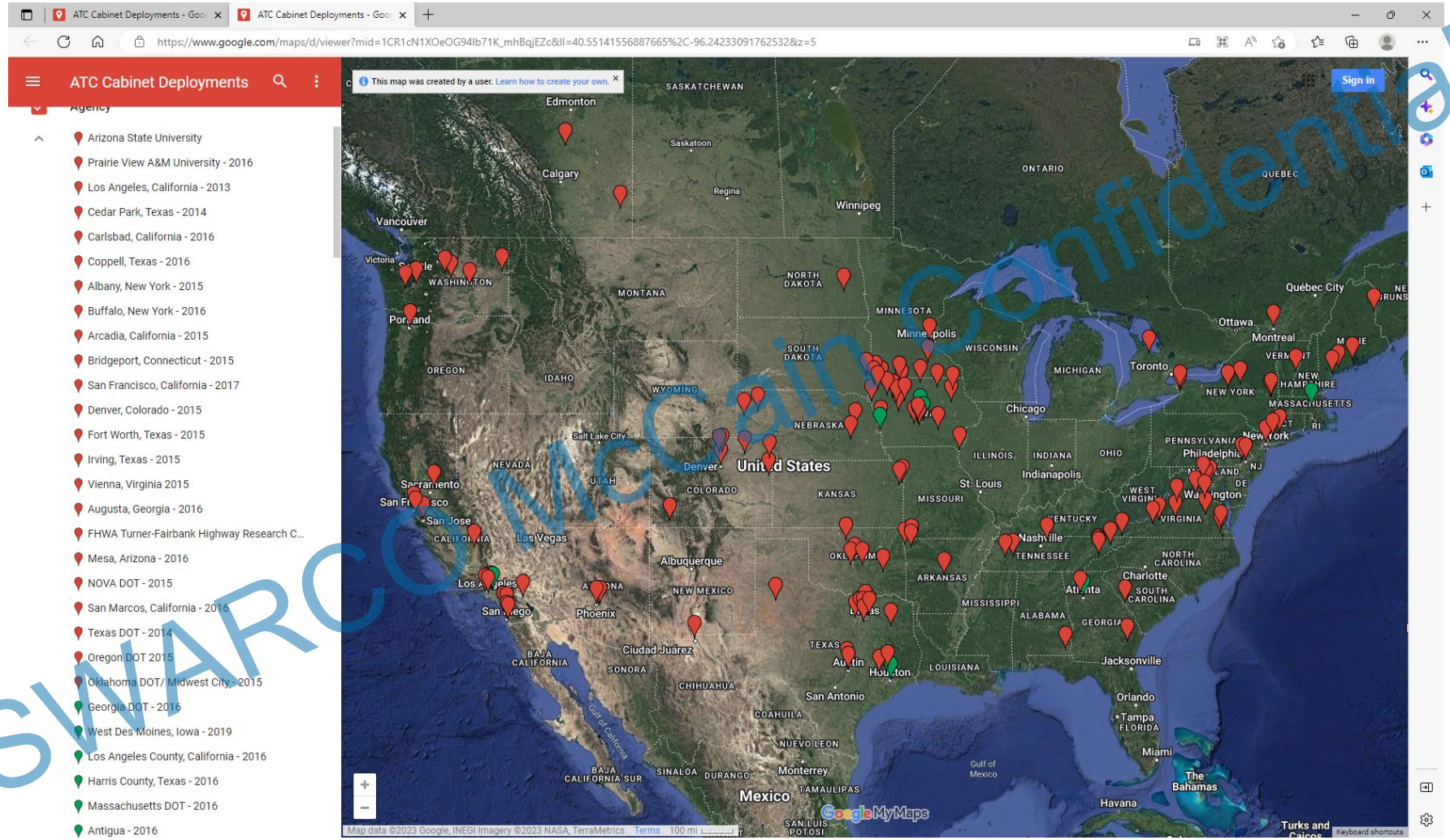

https://www.google.com/maps/d/viewer?mid=1CR1cN1XOeOG94lb71K_mhBqjEZc&ll=39.55963119232842%2C-95.2330776&z=5