

E-Load SA – the new upgrade system for testing solutions in the production line

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CMWTEC Sales Engineer

PRODUCT GROUPS

SEMI AUTOMATIC EQUIPMENT

Automatic Process

Semi Automatic Handling

Laboratory and Test Applications



ECO BATTERY FINISHING EQUIPMENT

Automatic Process

Semi Automatic Handling

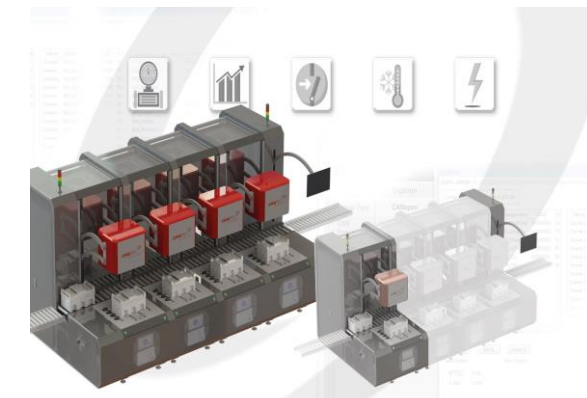
Standard Components, Push Buttons, No Name PLC

PREMIUM FINISH LINE EQUIPMENT

Automatic Process

Fully Automatic Process

State of the Art, Tailor-Made, Continuous Developments



TEST EQUIPMENT LI-ION

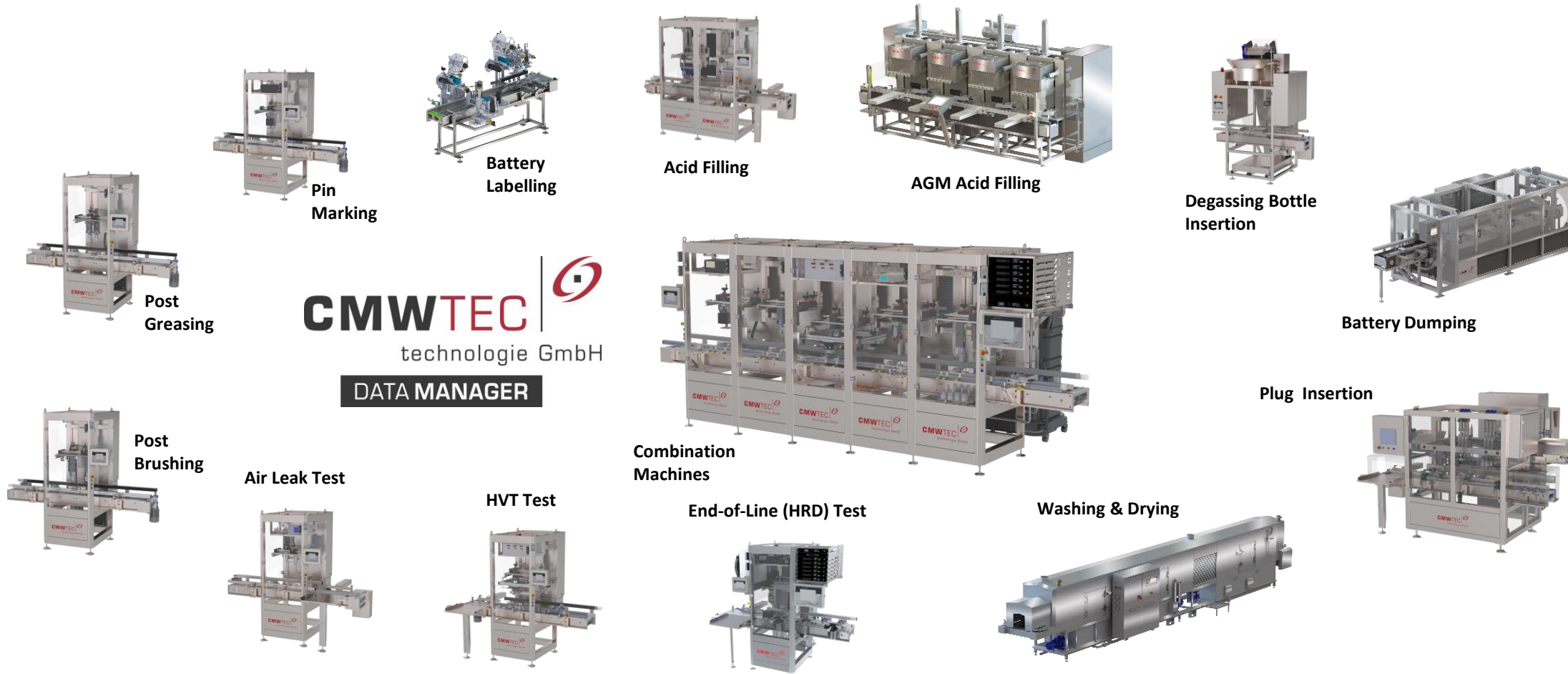
Semi Automatic Process

Automatic Process

Individual Test Applications

OVERVIEW MACHINE PORTFOLIO

Technology
Made in Germany



HARDWARE END-OF-LINE TEST MACHINE

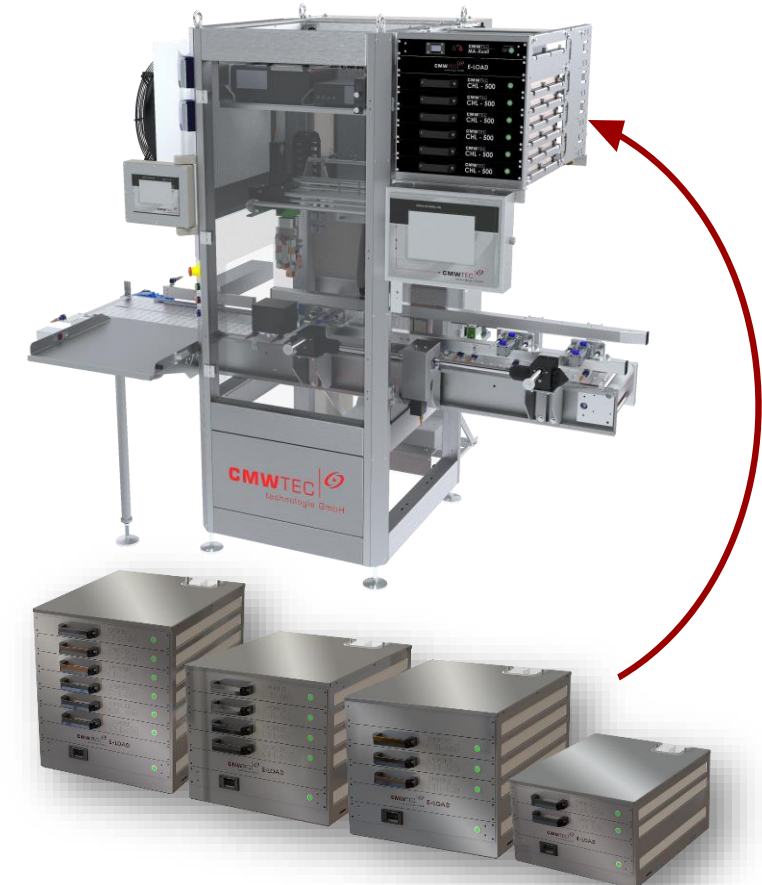
Technology
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New Electronic Load and Machine Design

- Water Cooled Electronic Load (closed water circuit)
- Small & large applications from 500A to 3000A
- Modular and scalable design by 500A plug-in modules
- High dynamic MOSFET technology
- Extremely small footprint due to new water-cooled heatsink design
- Fully enclosed and sealed. Suited for tough environmental conditions
- Low noise level
- Integrated polarity switch
- Most flexible test software
- Storage for 1000 test recipes with sequences of up to 5 test profiles

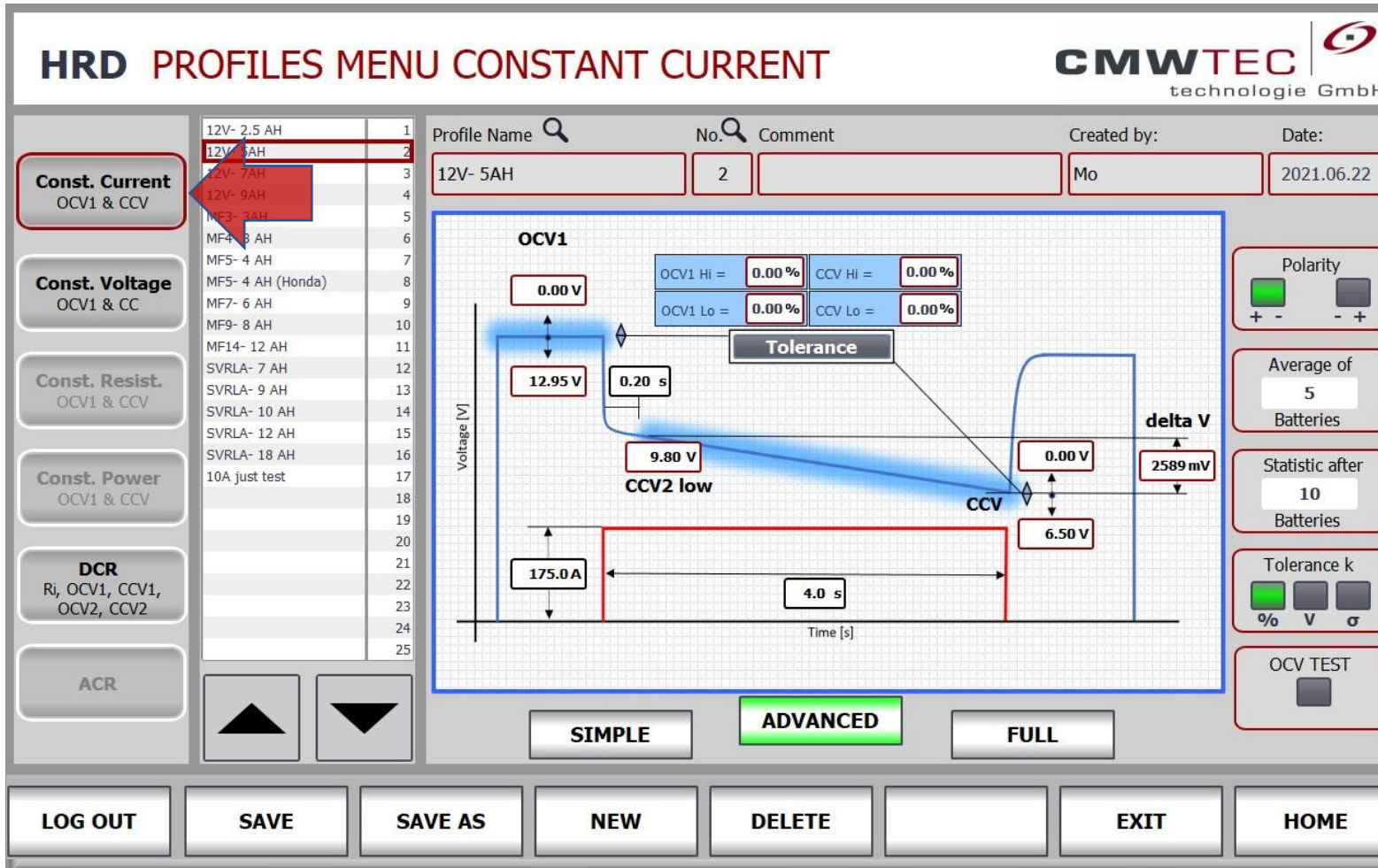


3000A Load – no increase of footprint



DEFINITION OF TEST PROFILES WITH REJECTION CRITERIA

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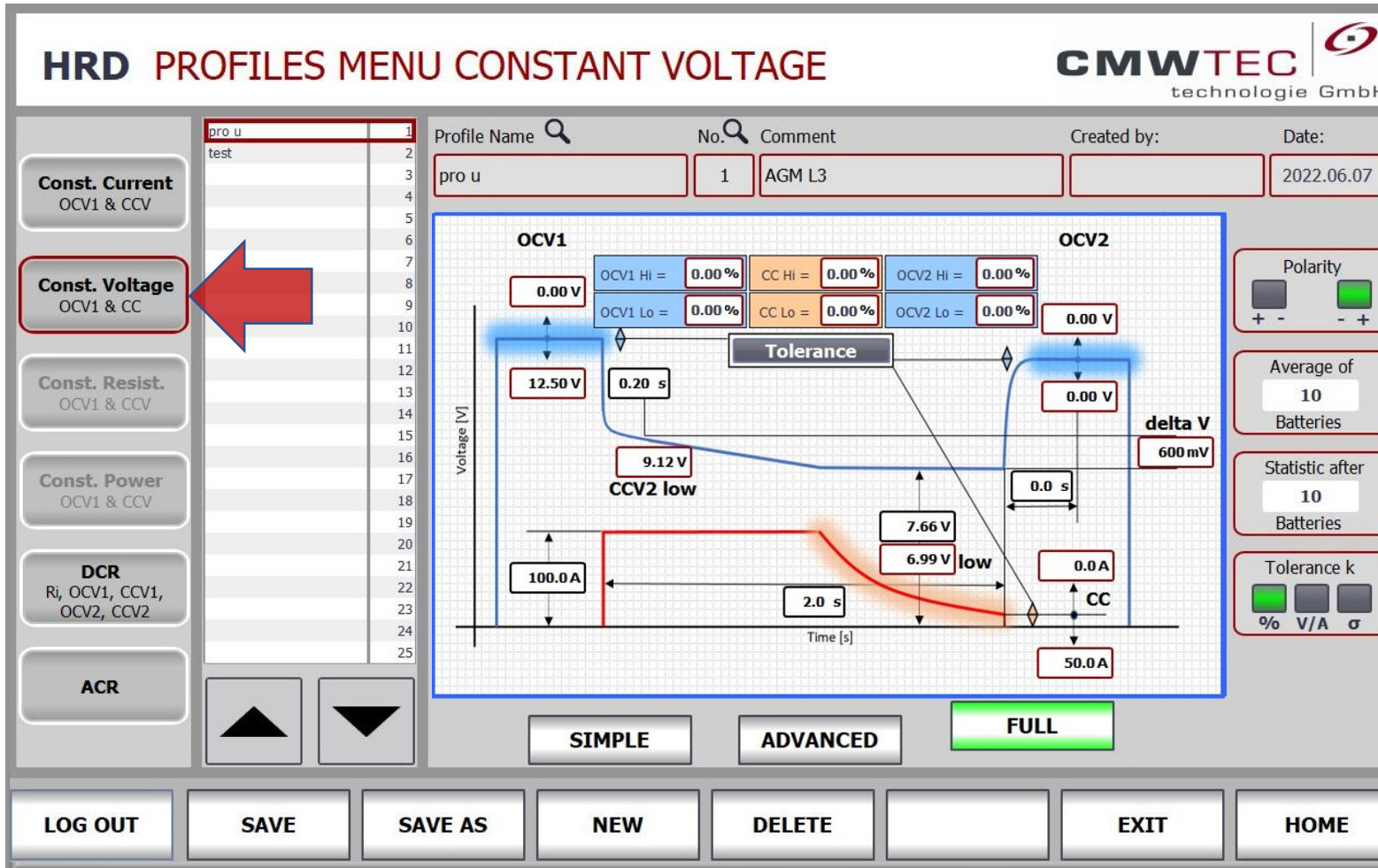


Example: Constant Current Profile

- Setting of test values
- Setting of test time
- Setting of min/max limits
- Setting of tolerance limits
- and much more like Polarity, Statistic, etc.
- Individually for each battery model

DEFINITION OF TEST PROFILES WITH REJECTION CRITERIA

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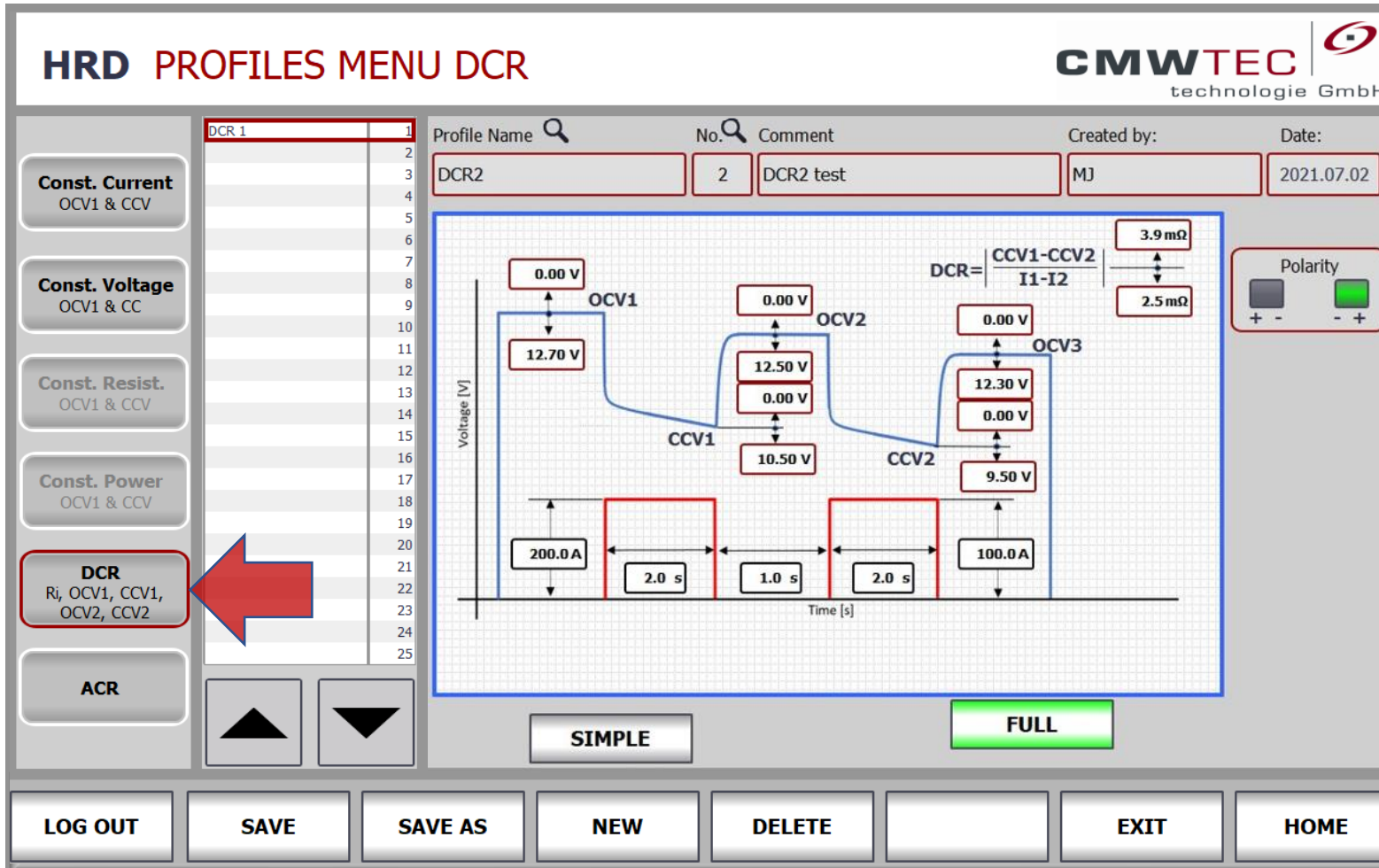


Example: Constant Voltage Profile

- Setting of test values
- Setting of test time
- Setting of min/max limits
- Setting of tolerance limits
- and much more like Polarity, Statistic, etc.
- Individually for each battery model

DEFINITION OF TEST PROFILES WITH REJECTION CRITERIA

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Example: DCR Profile

- Setting of test values
- Setting of test time
- Setting of min/max limits
- Setting of Polarity
- Individually for each battery model

DEFINITION OF TEST PROFILES WITH REJECTION CRITERIA

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HRD PROFILES MENU ACR

CMWTEC technologie GmbH

Profile Name	No.	Comment	Created by:	Date:
Profile ACR1	1	sereis		2022.08.22

OCV1 Start Frequency SEREIS 1000.0 Hertz

0.00 V

12.40 V

AC current [A]

Frequency

Z(Re): 8.0 mΩ / 0.0 mΩ

Δ ACR MAX to previous ACR Test 0.00 mΩ

LOG OUT SAVE SAVE AS NEW DELETE EXIT HOME

Example: ACR Profile

- Setting of test values
- Setting of start frequency
- Setting of min/max limits
- Setting of ACR Max limits
- Individually for each battery model

TEST RESULTS FOR TEST SEQUENCE

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HRD MAIN MENU

Job Number
20220831_144448_Line01

Batt. Name/Test Sequence
ACR-CC-DCR-ACR

Profile 1
A-001

Profile 2
I-001

Profile 3
D-001

Profile 4
A-003

Profile 5

Comment

Time
3:17:32 PM

Ready

Active

OCV1

CC

CCV

DV

DCR

OCV2

ACR

0.00 V

0.0 A

No.	Battery ID	Time	Result	Passed	Failed	OCV1	CC	CCV	DCR	OCV2	OCV1 AVG	ACR mΩ	Δ ACR mΩ
5	WAAGAWX95610034	3:07:01 PM	OK	3	2	0.000 V						4.827	+0.049
5	WAAGAWX95610034	3:06:58 PM	OK	2	2	12.462 V	149.9 A	11.366 V	6.68mΩ				
5	WAAGAWX95610034	3:06:53 PM	OK	2	2	12.712 V	1000.1 A	7.043 V					
5	WAAGAWX95610034	3:06:51 PM	OK	2	2	0.000 V						4.778	
4	WAAGAWX95610031	3:06:40 PM	OK	2	2	0.000 V						3.631	+0.001
4	WAAGAWX95610031	3:06:37 PM	OK	1	2	12.354 V	149.9 A	11.478 V	5.24mΩ				
4	WAAGAWX95610031	3:06:32 PM	OK	1	2	12.736 V	1000.0 A	8.104 V					
4	WAAGAWX95610031	3:06:29 PM	OK	1	2	0.000 V						3.630	
3	WAAGAWX95610030	3:06:24 PM	OK	1	2	0.000 V						4.029	+0.014
3	WAAGAWX95610030	3:06:21 PM	OK	0	2	12.407 V	149.9 A	11.387 V	5.81mΩ				
3	WAAGAWX95610030	3:06:16 PM	OK	0	2	12.722 V	1000.0 A	7.673 V					
3	WAAGAWX95610030	3:06:14 PM	OK	0	2	0.000 V						4.014	
2	WAAGAWX95610032	3:05:13 PM	CCV-low	0	2	12.703 V	1000.1 A	6.912 V					
2	WAAGAWX95610032	3:05:10 PM	OK	0	1	0.000 V						4.690	
1	WAAGAWX95610034	3:01:00 PM	D ACR>MAX	0	1	0.000 V						4.780	+0.124
1	WAAGAWX95610034	3:00:57 PM	OK	0	0	12.428 V	150.0 A	11.334 V	6.63mΩ				

ALM HISTORY

GRAFIC

V(t)

TEST SETUP

DATA

LOGOUT

START SCREEN

Allow different Test Profiles
setting in **just one sequence**

As an Example

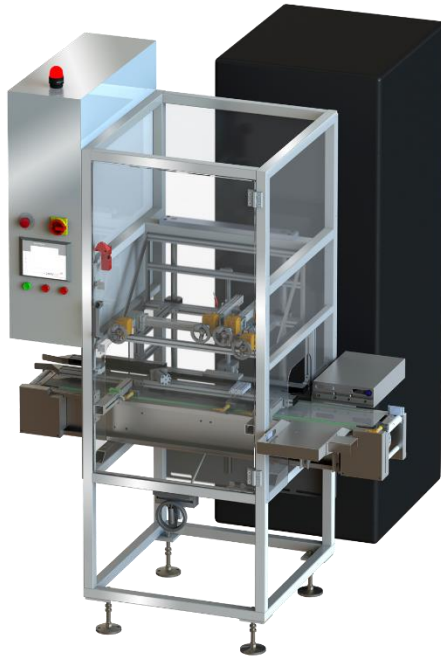
- A-001 1st ACR Test
- I-001 Const Current Test
- D-001 DCR Test
- A-003 2nd ACR Test
- Test Result per Battery
- Test Result per each Test

REBUILD HRD TO END-OF-LINE TEST MACHINE

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Upgrade from PLT

BEFORE



- **PLT Systems are discontinued**
- No new Spare Parts when stock is empty
- Modules will only be repaired and exchanged

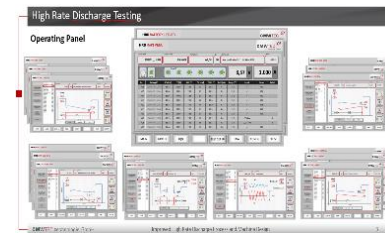
Upgrade Kit

for CMWTEC machines



- New Software
- Smaller Footprint
- Water cooled system
- Modular design
- Scalable load

AFTER



UPGRADE HRD TO END-OF-LINE TEST MACHINE

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End-of-Line Applications



Racks for
3000A / 2000A / 1500A / 1000A,
others on request

**Stand-Alone
Unit**

**Individual
add-on to Machines
(replacing
existing PLT's)**



- Plug and Play with CMW or instead Digatron equipment
- Easy integration even with 3rd party equipment
- New Software
- Water cooled system
- Modular design
- Scalable load

REFERENCE CASE – GERMANY – DEFECTIVE PLT

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REFERENCE CASE – GERMANY – NEW CMWTEC E-LOAD SA

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PLUG AND PLAY



OPTIONAL FEATURES OF E-LOAD SA and RETROFIT KIT

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- „0-Volt function“ available for low voltage testing of batteries and cells
- Possibility of implementation of ACR Impedance testing can be checked individually

DEVELOPMENT OF EOL TEST EQUIPMENT

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Development EOL

Customer Trials
SerEIS, ELBC

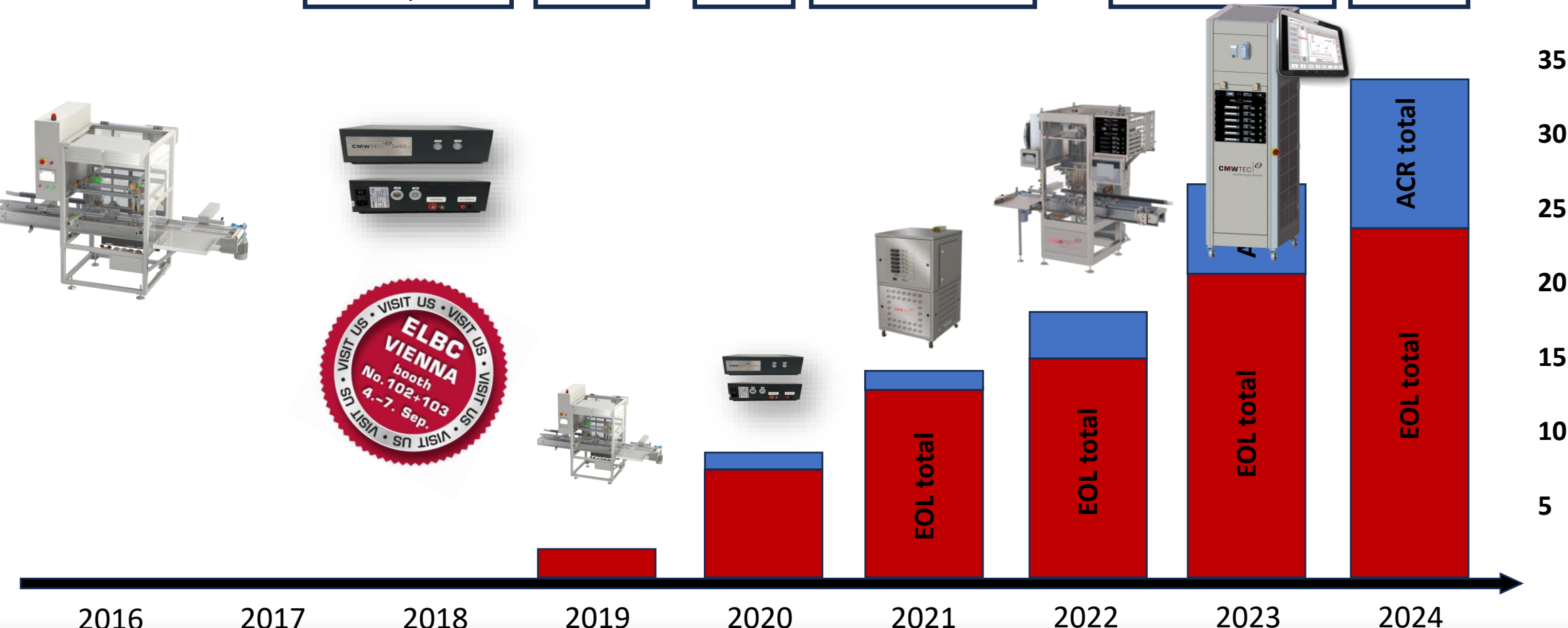
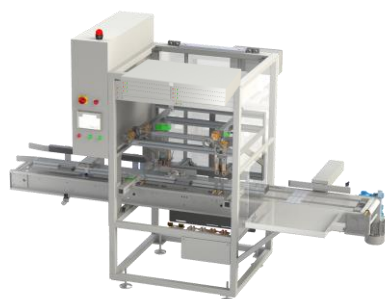
Install.
2 EOL's

Install.
SerEIS

1. Rebuild Kit
Stand Alone 1. Ed.

No More PLT!!!
Stand Alone 2. Ed.

0-Volt
feature



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