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TechTalks
Online Seminars

MCC Overload Relay Migration

May 14, 2020

Introductions

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The Reynolds Company
Dallas

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Topics:

E3 and E3 Plus
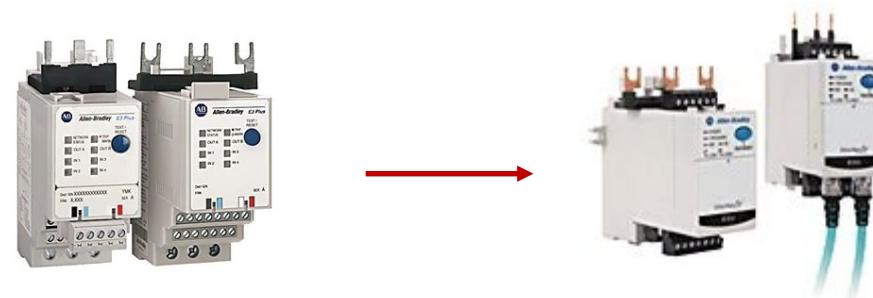E1 Plus

E3 Plus to E300 Migration

E3 Plus Overload Relay

October 2018 – End of Life Announced
October 2019 – Discontinued

- ## E3 Plus Overload Relay
  - Introduced 20+ years ago
  - Recommend replacing with next generation E300 Overload Relays

Catalog Number	Product Description	Discontinued Date*	Recommended Replacement	Description	Replacement Category**
193-EC1, 193-EC2/EC3, 193-EC4, 193-EC5	E3/E3 Plus Electronic Overload Relay	Oct. 2019	193/592-ESM, 193/592-EIO, 193-ECM	E300 Electronic Overload Relay	Direct Replacement

- ## Web Pages
  - https://ab.rockwellautomation.com/Circuit-and-Load-Protection/LV-Motor-Protectors/E3-Plus-Overload-Relays
  - https://ab.rockwellautomation.com/Circuit-and-Load-Protection/LV-Motor-Protectors/E300-Overload-Relays

E3 Migration Paths

E3 Plus

E300 Overload Relay

* Recommended*

- **Functionality Differences**
  - Current sensing capabilities are the same
- **Physical Differences**
  - 11 mm (~1/2 in) taller than the E3 Plus
- **Communication Options**
  - Embedded
    - EtherNet/IP
    - DeviceNet
- **Technical Data**
  - https://literature.rockwellautomation.com/idc/groups/literature/documents/td/193-td006_-en-p.pdf
  - https://literature.rockwellautomation.com/idc/groups/literature/documents/um/193-um015_-en-p.pdf

E1 Plus Overload Relay

~Spring 2021 Discontinuance in planning

- **Functionality Differences**
  - Limited current sensing capabilities
- **Physical Differences**
  - Smaller
- **Communication Options**
  - Side Mount Module
    - Use with 193-EE version
    - EtherNet/IP
    - DeviceNet

E100 Overload Relay

~Nov 2019 Launch in planning

- **Functionality Differences**
  - Limited current sensing capabilities
- **Physical Differences**
  - Smaller
- **Communication Options**
  - None at launch
  - Below EtherNet Linking Technology to be supported in future

E300 Electronic Overload Relay

The E300™ Electronic Overload Relay is the latest technology for motor protection that will help reduce your motor control investment and keep your plant running.

Communication Module

193-ECM*

Features
- EtherNet/IP
- DeviceNet
- E200/Parameter Configuration Module (PCM)

Includes Single USB Type B interface port

Control Module

193-EIO*

Control Voltage	I/O		I/O and Protection†	
	Inputs	Relay Outputs	Inputs	Relay Outputs
110…120V AC 50/60 Hz	4	3	2	2
	2	2	–	–
220…240V AC 50/60 Hz	4	3	2	2
	2	2	–	–
24V DC	6	3	4	2
	2	2	–	–

Sensing Module

592/193-ESM*

Sensing Options:
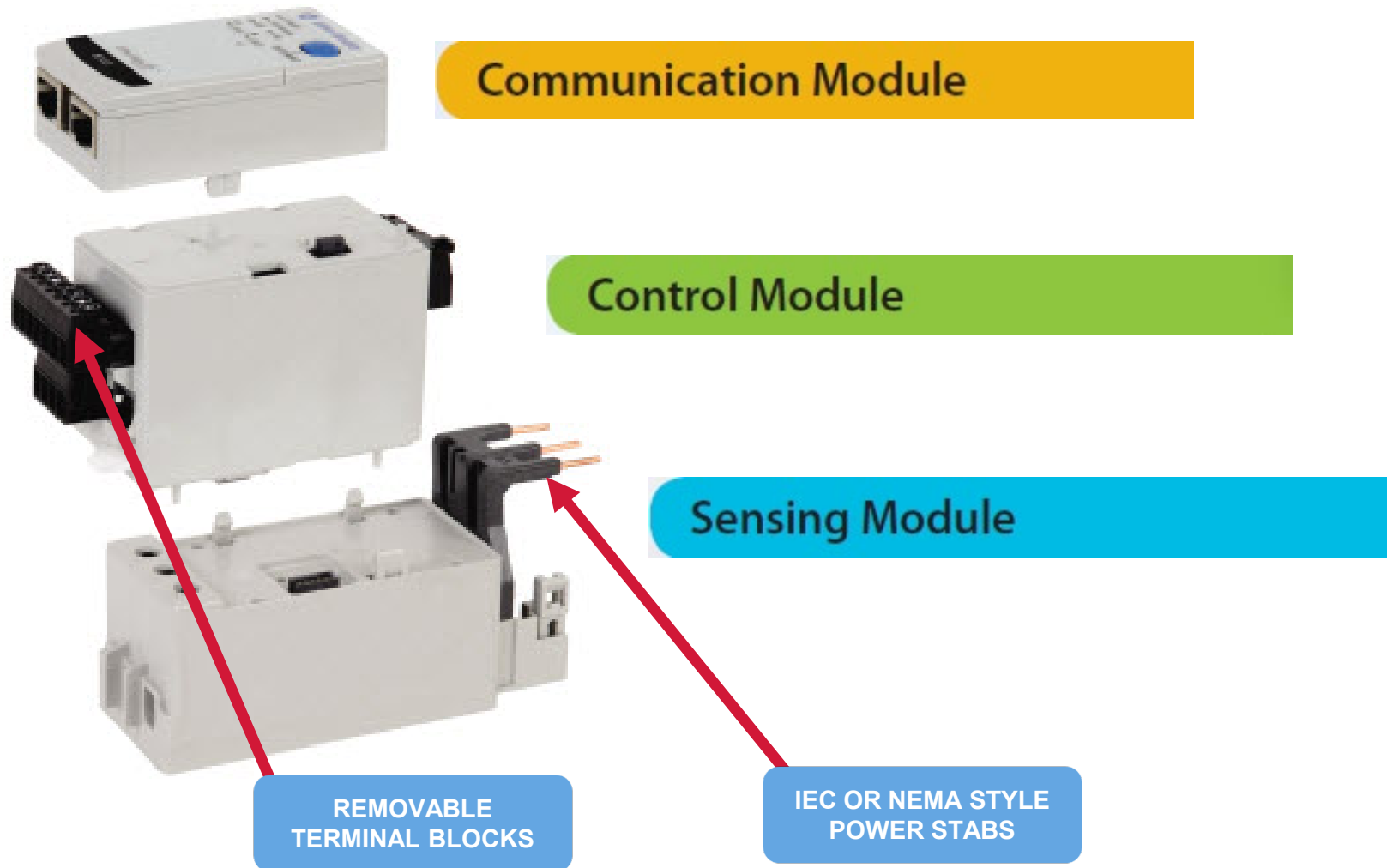- Voltage/Current/Ground Fault
- Current/Ground Fault
- Current

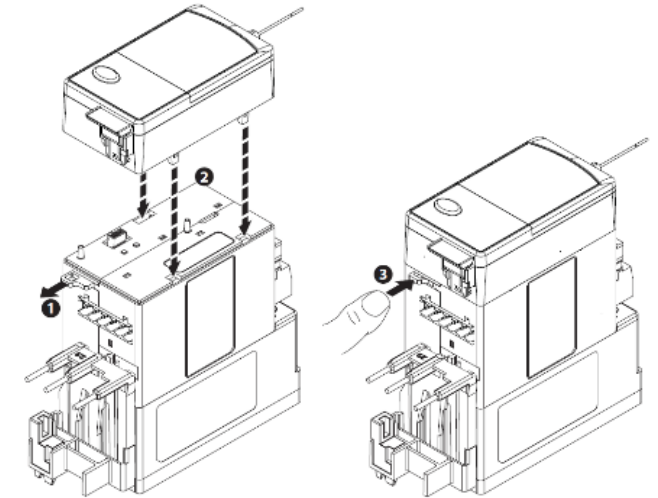**Current Range:**
- 0.5…30 A
- 6…60 A
- 10…100 A
- 20…200 A

Current transformer solutions available for applications above 200 A

DS

E300 Electronic Overload Relay

- Modular Design

Communication Module

Control Module

Sensing Module

REMOVABLE TERMINAL BLOCKS

IEC OR NEMA STYLE POWER STABS

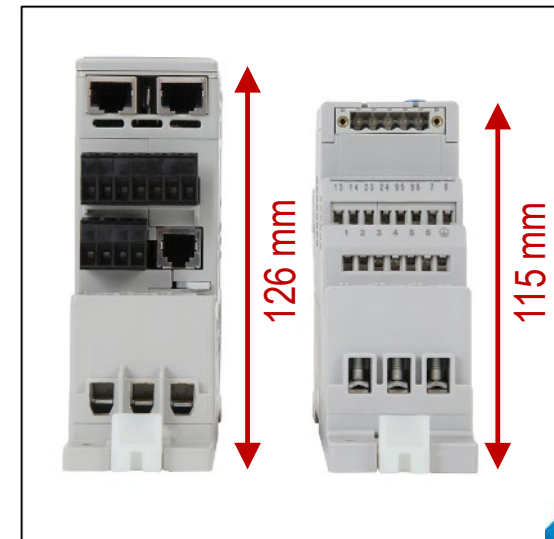E300 Overload Relay modules easily snap together and are secured with locking tabs.

54 Pre-Configured Operating Modes

- Overload
- Non-reversing Starter
- Reversing Starter
- Wye/Delta Starter
- Two-speed Starter
- Monitoring Device

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E300 vs E3 Plus

Dimensional Comparison

148 mm

45 mm   45 mm

126 mm   115 mm

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E300 vs. E3 Plus

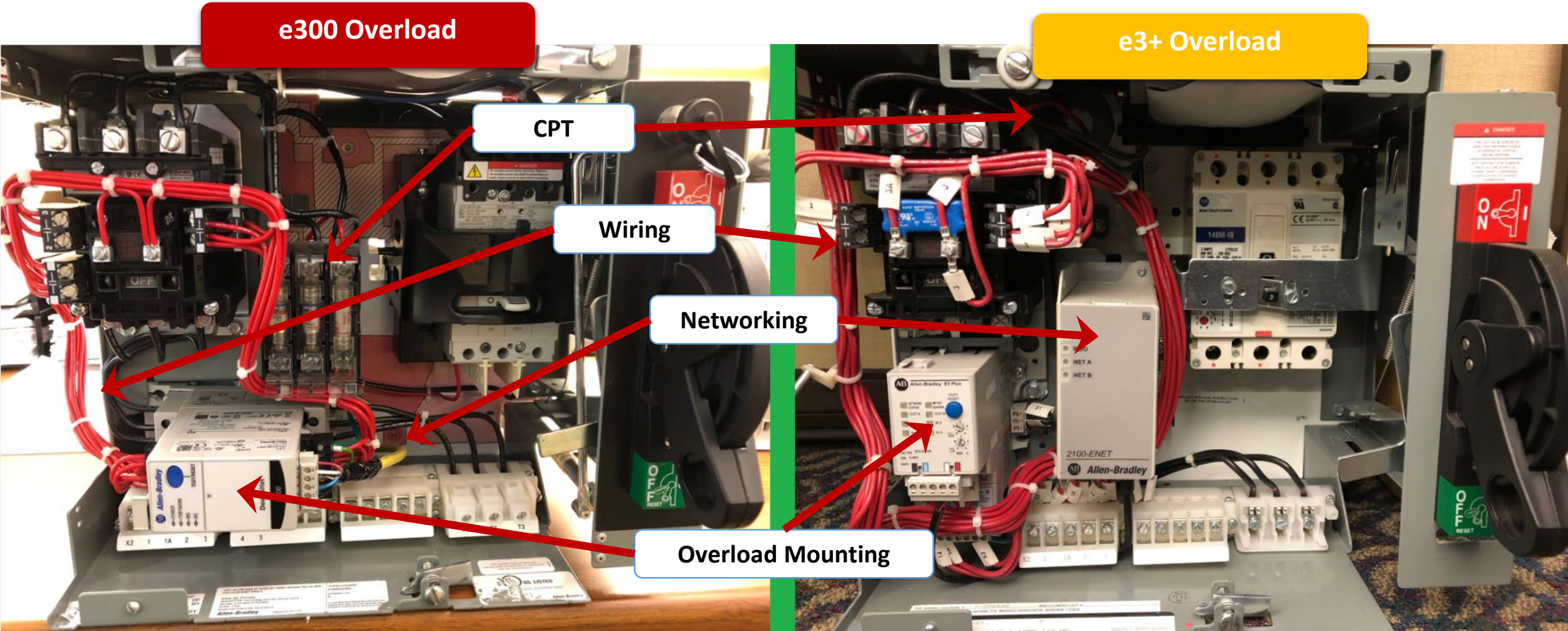**CENTERLINE 2100 NEMA Low Voltage Motor Control Center Considerations**

- **NEMA 1.0 Space Factor Units**

  - **Due to the increased depth of the E300, the clearance between the face of the E300 to the door is extremely close**

  - **Recommended to replace the unit with new containing an E300**

- **CENTERLINE 2100 LV MCC Selection Guide**

  - **https://literature.rockwellautomation.com/idc/groups/literature/documents/sg/2100-sg003_-en-p.pdf**

CENTERLINE 2100 Starter Space Factor

Space Factor	E3/E3 Plus	E300
0.5	-	Size 1
1	Size 1 Size 2	Size 1 Size 2
1.5	Size 2	Size 1 Size 2 Size 3
2	Size 3	Size 3 Size 4
2.5	Size 3 Size 4	Size 4
3	Size 4	-
3.5	Size 5	Size 5
4	Size 6	-
6	Size 6	Size 6

Difficulty Surrounding e3 Modernizations

Why the LVMCC Business Discourages Customer Retrofits

e300 Overload

e3+ Overload

CPT

Wiring

Networking

Overload Mounting

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I/O Count

Table 136 - E3 / E3 Plus / E300 Digital Expansion I/O

E3 / E3 Plus Overloads			E300 Overloads								
E3 / E3 Plus	24V DC Control		E300 Control Module Option	120V AC Control				24V DC Control			
	Inputs	Outputs		Inputs		Outputs		Inputs		Outputs	
E3	2	1	CN – Standard Control Module	4		3		6		3	
E3 Plus	4	2	GN / GT – Ground Fault and PTC Control Module	FVNR	FVR	FVNR	FVR	FVNR	FVR	FVNR	FVR
				2	6[1]	2	4[1]	4	8[1]	2	4[1]

(1) I/O count includes expansion module I/O points

Multiple option numbers are separated by a dash and added to the base catalog number in ascending order.

- The expansion module inputs will need to be programmed by the customer if they want them to produce any 'action' (i.e. do something other than monitor the status of a contact).

Control Station Terminology

Legacy Control Station
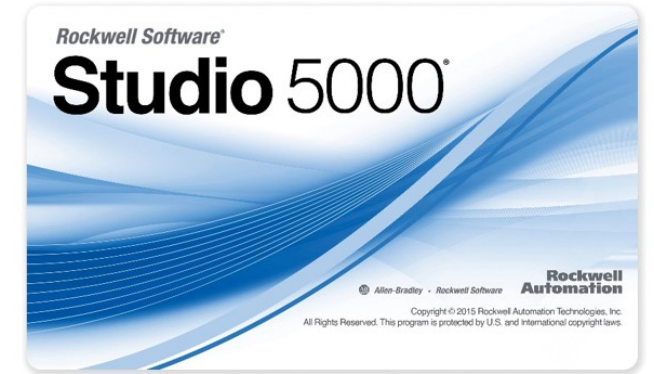
E300 Operator Stations

E300 Control Station | E300 Diagnostic Station

E300 – Advanced Electronic Overload Relay

Network Connectivity – EtherNet/IP

- Two Ethernet ports that operate as an Ethernet switch

  - Star Topology

  - Linear Topology

  - Ring Topology (DLR)

- Embedded web server

- Supports SMTP messaging

- Automatic Device Configuration (ADC)

New ▾ Reply ▾ Reply to All ▾ Forward ▾ ... Display ▾ More ▾

E300 Overload Relay has detected a Trip
bsmith to: whmartin

Trip Type:	OverloadTrip
Trip Info:	Motor current overload condition
Device Name:	E300 Overload Relay
Device Description:	Chiller Pump 2
Device Location:	6-U29
Contact Info:	Bob Smith
	x555

Rockwell Software®
Studio 5000
Allen-Bradley · Rockwell Software
Rockwell Automation
Copyright ©2015 Rockwell Automation Technologies, Inc.
All Rights Reserved. This program is protected by U.S. and international copyright laws.

Allen-Bradley   E300 4In3Out120VAC VIGPt5to30Amp   **Rockwell Automation**

Expand	Minimize
Home	
Parameters	
Device Monitor	
Current Monitor	
Voltage Monitor	
Power Monitor	
Energy Monitor	
Analog Monitor	
Trip/Warn Histry	
Trip Snapshot	
Command	
Overload Setup	
Device Setup	
Options Setup	
Current Setup	
Comms Setup	
Output Setup	
DeviceLgx Setup	
Voltage Setup	
Power Setup	
DiagDsply Setup	
Analog1 Setup	
Analog2 Setup	
Analog3 Setup	
Analog4 Setup	
Diagnostics	
Administrative Settings	
EDS File	

Current Monitor

Parameter	Name	Data Type	Value	Unit
43	L1Current	DINT	0.47	Amps
44	L2Current	DINT	0.47	Amps
45	L3Current	DINT	0.48	Amps
46	AverageCurrent	DINT	0.47	Amps
47	L1PercentFLA	UINT	94.4	%
48	L2PercentFLA	UINT	95.4	%
49	L3PercentFLA	UINT	97.2	%
50	AvgPercentFLA	UINT	95.6	%
51	GFCurrent	UINT	0.39	Amps
52	CurrentImbal	USINT	2	%

Seconds between refresh: 3   Disable Refresh with 0.

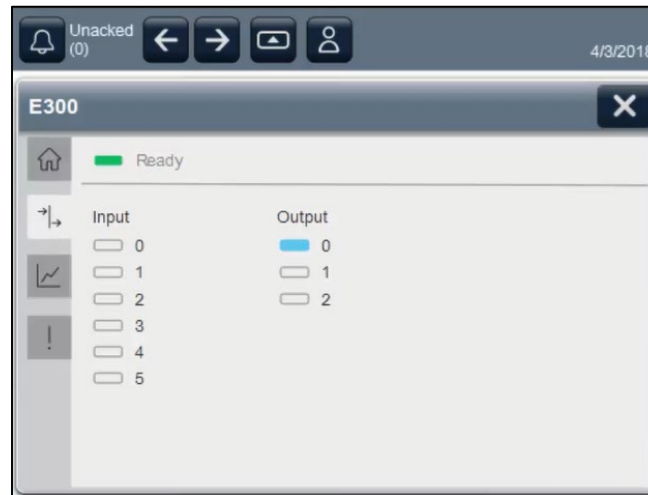Copyright © 2012 Rockwell Automation, Inc. All Rights Reserved.

E300 – Advanced Electronic Overload Relay

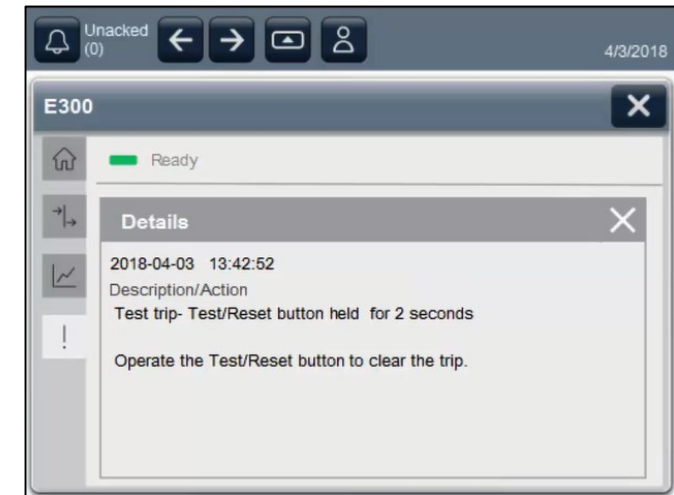- Network Connectivity – Pre-configured Operator Faceplate Objects

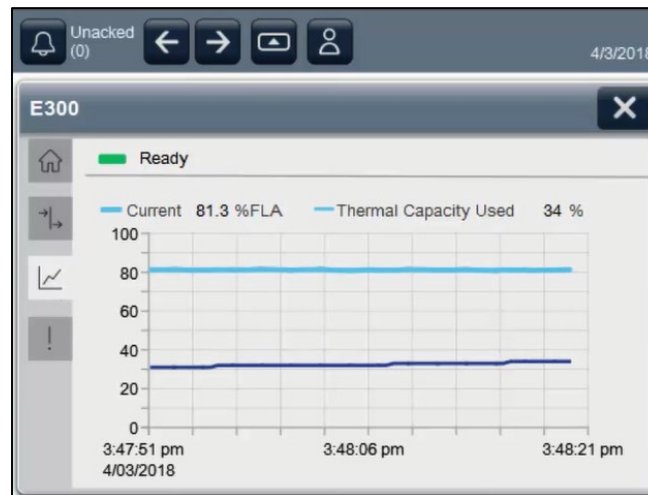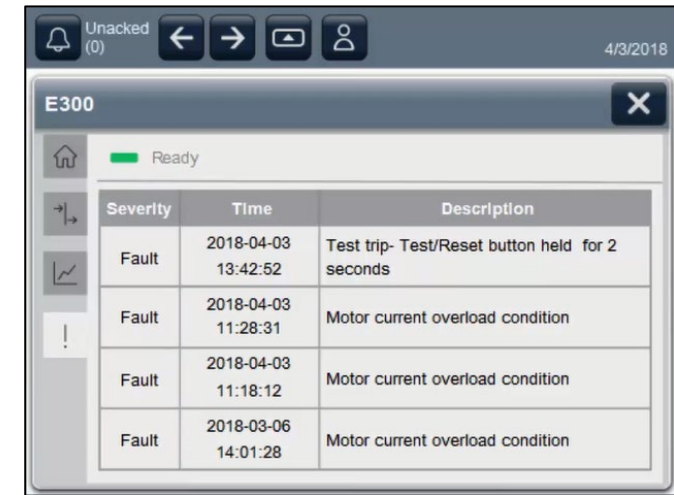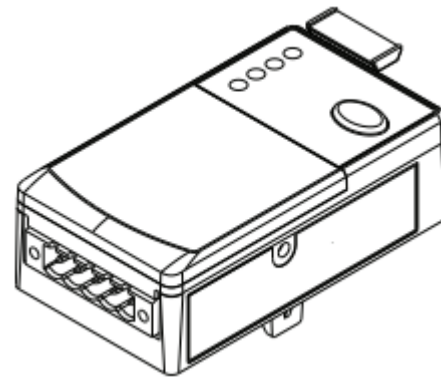Device Status &
Maintenance Control

Device I/O &
Trending

Device Diagnostics &
Event Details

Available for Download on the RA PCDC

DeviceNet Communications

- **The E300 DeviceNet communication module (193-ECM-DNET) supports the following:**

- One 5-pin DeviceNet connector - NEW

- Rotary dials to select the node address of the device

- RSNetWorx for DeviceNet support

- Automatic Device Recovery (ADR)

- LED status indication for device power, trip/warning status, and communication status

- E3 Plus emulation mode that lets you reuse configuration parameters when using tools such as Automatic Device Replacement (ADR), DeviceNet Configuration Terminal (193-DNCT) or RSNetWorx for DeviceNet

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DeviceNet Communications

Considerations

- Must use RSNetWorx for DeviceNet Revision 27.00.00 or later

- Studio 5000®, minimum version recommended to support the E300 is v20

- Must configure the E300 DeviceNet drivers using RSLinx before they are available to RSNetWorx

    - The E300 Overload Relay EDS files may not be included

    - To download the E300 EDS file: https://www.rockwellautomation.com/global/support/networks/eds.page?

- Operating as an emulated E3/E3 Plus, the outputs are non-configurable

    - Assuming equivalent I/O availability prior to entering E3/E3 Plus emulation mode, the emulated device assigns:

        - Relay 1 (E300 R13/R14) as the OL trip relay

        - Relay 0 (E300 R03/R04) is designated as E3 Plus Output A

        - Relay 2 (E300 R23/R24) is designated as E3 Plus Output B (i.e. control relays)

- One single expansion digital I/O module can be used for supplemental I/O for control module configurations which do not have sufficient I/O when using emulation mode. Expansion I/O beyond those needed by the emulated E3/E3+ will not be usable.

E3 Plus Emulation mode

E3 Emulation mode is enabled from the factory CTO when wiring option "-18M" is selected

- E3 Plus Emulate configuration parameter is set to the E3 Plus product code that the E300 should emulate using the
  - This parameter setting is automatically selected based on which E300 model is configured in PCBr
- The E300 boots up as an E3 Plus v6.xx.
  - An actual E3+ stopped developing firmware at 5.xx
- Internally, the E300 will re-map the E300 parameters to match the parameter numbers of the E3 Plus.
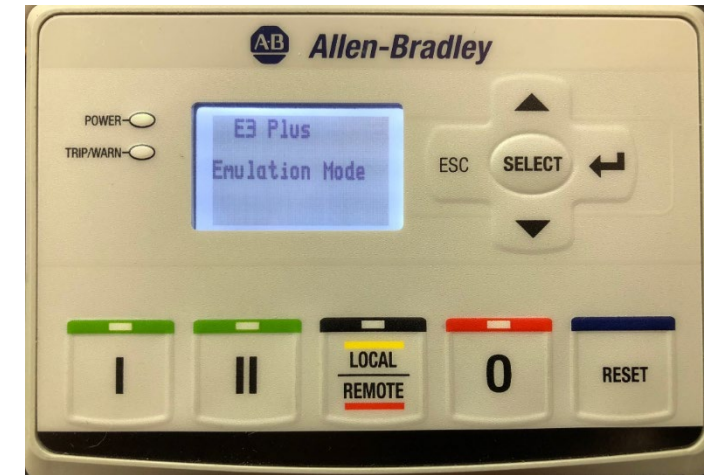
Emulation Mode

I/O Mapping

E3/E3+ I/O	E300 on DNet I/O while in E3+ Emulation Mode
Outputs	
Out A – 13/14	Relay 0 – R03/R04
Out B – 23/24	Relay 2 – R23/R24**
OL Trip – 95/96	Relay 1 – R13/14
Inputs	
IN1	IN0
IN2	IN1
IN3	IN2
IN4	IN3

**Note: This output is not available for E300 Control Modules that have fewer than 3 outputs.

Below shows how the DeviceNet output data relates to the E300 Relays

Name	Valu	Description
⊿ Local:2:O.Data[0]	0	
Local:2:O.Data[0].0	0	Out A
Local:2:O.Data[0].1	0	Out B
Local:2:O.Data[0].2	0	Trip Reset
Local:2:O.Data[0].3	0	
Local:2:O.Data[0].4	0	
Local:2:O.Data[0].5	0	Remote Trip
Local:2:O.Data[0].6	0	
Local:2:O.Data[0].7	0	

Emulation Mode

Valid E300 DeviceNet Emulated E3/E3+ Profiles

Valid E300 DeviceNet Emulated E3/E3+ Profiles							
Product Code	Name String	Model	Description	Range	Lower	Upper	Schematic Note
3	E3 (1 … 5 A)	EC1	E3	(1 … 5 A)	1	5	Emulation Mode Parameter 300 = 3 [E3 (1 … 5 A)]
4	E3 Plus (1 … 5 A)	EC2	E3 Plus	(1 … 5 A)	1	5	Emulation Mode Parameter 300 = 4 [E3 Plus (1 … 5 A)]
5	E3 (3 … 15 A)	EC1	E3	(3 … 15 A)	3	15	Emulation Mode Parameter 300 = 5 [E3 (3 … 15 A)]
6	E3 Plus (3 … 15 A)	EC2	E3 Plus	(3 … 15 A)	3	15	Emulation Mode Parameter 300 = 6 [E3 Plus (3 … 15 A)]
7	E3 (5 … 25 A)	EC1	E3	(5 … 25 A)	5	25	Emulation Mode Parameter 300 = 7 [E3 (5 … 25 A)]
8	E3 Plus (5 … 25 A)	EC2	E3 Plus	(5 … 25 A)	5	25	Emulation Mode Parameter 300 = 8 [E3 Plus (5 … 25 A)]
9	E3 (9 … 45 A)	EC1	E3	(9 … 45 A)	9	45	Emulation Mode Parameter 300 = 9 [E3 (9 … 45 A)]
10	E3 Plus (9 … 45 A)	EC2	E3 Plus	(9 … 45 A)	9	45	Emulation Mode Parameter 300 = 10 [E3 Plus (9 … 45 A)]
11	E3 (18 … 90 A)	EC1	E3	(18 … 90 A)	18	90	Emulation Mode Parameter 300 = 11 [E3 (18 … 90 A)]
12	E3 Plus (18 … 90 A)	EC2	E3 Plus	(18 … 90 A)	18	90	Emulation Mode Parameter 300 = 12 [E3 Plus (18 … 90 A)]
29	E3 (0.4 … 2 A)	EC1	E3	(0.4 … 2 A)	0.4	2	Emulation Mode Parameter 300 = 29 [E3 (0.4 … 2 A)]
30	E3 Plus (0.4 … 2 A)	EC2	E3 Plus	(0.4 … 2 A)	0.4	2	Emulation Mode Parameter 300 = 30 [E3 Plus (0.4 … 2 A)]
31	E3 (9 … 5000 A)	EC1	E3	(9 … 5000 A)	9	5000	Emulation Mode Parameter 300 = 31 [E3 EC1 (9 … 5000 A)]
36	E3 EC3 (1 … 5 A)	EC3	E3 Plus external GF only	(1 … 5 A)	1	5	Emulation Mode Parameter 300 = 36 [E3 EC3 (1 … 5 A)]
38	E3 EC3 (3 … 15 A)	EC3	E3 Plus external GF only	(3 … 15 A)	3	15	Emulation Mode Parameter 300 = 38 [E3 EC3 (3 … 15 A)]
40	E3 EC3 (5 … 25 A)	EC3	E3 Plus external GF only	(5 … 25 A)	5	25	Emulation Mode Parameter 300 = 40 [E3 EC3 (5 … 25 A)]
42	E3 EC3 (9 … 45 A)	EC3	E3 Plus external GF only	(9 … 45 A)	9	45	Emulation Mode Parameter 300 = 42 [E3 EC3 (9 … 45 A)]
44	E3 EC3 (18 … 90 A)	EC3	E3 Plus external GF only	(18 … 90 A)	18	90	Emulation Mode Parameter 300 = 44 [E3 EC3 (18 … 90 A)]
46	E3 EC3 (0.4 … 2 A)	EC3	E3 Plus external GF only	(0.4 … 2 A)	0.4	2	Emulation Mode Parameter 300 = 46 [E3 EC3 (0.4 … 2 A)]
48	E3 EC3 (9 … 5000 A)	EC3	E3 Plus external GF only	(9 … 5000 A)	9	5000	Emulation Mode Parameter 300 = 48 [E3 EC3 (9 … 5000 A)]
50	E3 EC4 (1 … 5 A)	EC4	E3 Plus non-motor	(1 … 5 A)	1	5	Emulation Mode Parameter 300 = 50 [E3 EC4 (1 … 5 A)]
52	E3 EC4 (3 … 15 A)	EC4	E3 Plus non-motor	(3 … 15 A)	3	15	Emulation Mode Parameter 300 = 52 [E3 EC4 (3 … 15 A)]
54	E3 EC4 (5 … 25 A)	EC4	E3 Plus non-motor	(5 … 25 A)	5	25	Emulation Mode Parameter 300 = 54 [E3 EC4 (5 … 25 A)]
56	E3 EC4 (9 … 45 A)	EC4	E3 Plus non-motor	(9 … 45 A)	9	45	Emulation Mode Parameter 300 = 56 [E3 EC4 (9 … 45 A)]
58	E3 EC4 (18 … 90 A)	EC4	E3 Plus non-motor	(18 … 90 A)	18	90	Emulation Mode Parameter 300 = 58 [E3 EC4 (18 … 90 A)]
60	E3 EC4 (0.4 … 2 A)	EC4	E3 Plus non-motor	(0.4 … 2 A)	0.4	2	Emulation Mode Parameter 300 = 60 [E3 EC4 (0.4 … 2 A)]
62	E3 EC4 (9 … 5000 A)	EC4	E3 Plus non-motor	(9 … 5000 A)	9	5000	Emulation Mode Parameter 300 = 62 [E3 EC4 (9 … 5000 A)]
64	E3 EC5 (1 … 5 A)	EC5	E3 Plus w/Voltage, external GF only	(1 … 5 A)	1	5	Emulation Mode Parameter 300 = 64 [E3 EC5 (1 … 5 A)]
66	E3 EC5 (3 … 15 A)	EC5	E3 Plus w/Voltage, external GF only	(3 … 15 A)	3	15	Emulation Mode Parameter 300 = 66 [E3 EC5 (3 … 15 A)]
68	E3 EC5 (5 … 25 A)	EC5	E3 Plus w/Voltage, external GF only	(5 … 25 A)	5	25	Emulation Mode Parameter 300 = 68 [E3 EC5 (5 … 25 A)]
70	E3 EC5 (9 … 45 A)	EC5	E3 Plus w/Voltage, external GF only	(9 … 45 A)	9	45	Emulation Mode Parameter 300 = 70 [E3 EC5 (9 … 45 A)]
72	E3 EC5 (18 … 90 A)	EC5	E3 Plus w/Voltage, external GF only	(18 … 90 A)	18	90	Emulation Mode Parameter 300 = 72 [E3 EC5 (18 … 90 A)]
74	E3 EC5 (0.4 … 2 A)	EC5	E3 Plus w/Voltage, external GF only	(0.4 … 2 A)	0.4	2	Emulation Mode Parameter 300 = 74 [E3 EC5 (0.4 … 2 A)]
76	E3 EC5 (9 … 5000 A)	EC5	E3 Plus w/Voltage, external GF only	(9 … 5000 A)	9	5000	Emulation Mode Parameter 300 = 76 [E3 EC5 (9 … 5000 A)]

E300 vs. E3 Plus

NEW! E3 Plus to E300 Migration Guide

Migration Solutions

E3/E3 Plus to E300/E200 Electronic Overload Relay

A-B Allen-Bradley

Why Upgrade or Migrate

While the E3/E3 Plus Overload Relay has been a valuable part of our portfolio for the past twenty years, this product will no longer be available for sale after October 2019.* Now is the time to migrate to the E300™ or E200™ Electronic Overload Relay. As the latest state-of-the-art electronic overload relay offering, the E300/E200 Electronic Overload Relay offers many modular features designed to help improve your motor control and protection needs.

E300/E200 Basic Product Overview

- Modular design for application customization with various sensing, control and communication module options
- Diagnostic information to monitor motor performance
  - Current, voltage, power and energy
  - % Thermal capacity utilization
  - Time to trip/reset
  - Trip snapshot
  - Trip/warning histories
- Logix integration with add-on profiles, add-on instructions and pre-configured operator faceplate objects

E3/E3 Plus Electronic Overload Relay → E300/E200 Electronic Overload Relay

Why Upgrade or Migrate?

Rockwell Automation understands that your overload relays are a critical asset in your automation system, and we support that by providing you with the latest technology to maximize your investment. New technologies can improve and extend the operation of existing equipment and provide an immediate boost to productivity. By migrating from your legacy E3/E3 Plus™ Overload to a new E300/E200 Electronic Overload Relay, you can help to decrease downtime, increase speed to market, and optimize operations well into the future.

We will help you to meet this demand to innovate by proactively planning and managing your transition every step of the way to help you get the highest possible return on your automation investment.

ACTIVE* | ACTIVE MATURE* | END OF LIFE* | DISCONTINUED*

RA Publication MIGRAT-PP042_-EN-P

E3/E3 Plus to E300/E200 Electronic Overload Relay

Feature	ANSI/IEEE Device No.	EC1	EC2	EC3	EC4	EC5	E200	E300
Current Range (A)	N/A	0.4...5000	0.4...5000	0.4...5000	0.4...5000	0.4...5000	0.5...65000	0.5...65000
Thermal Overload	49/51	✓	✓	✓	✓	✓	✓	✓
Auto or Manual Reset	86	✓	✓	✓	✓	✓	✓	✓
Mechanical Jam (Stall)	48	✓	✓	✓	✓	✓	✓	✓
Undercurrent	37	✓	✓	✓	✓	✓	✓	✓
Phase Loss	46	✓	✓	✓	✓	✓	✓	✓
Zero Sequence Ground Fault	50G		✓	✓	✓	✓	✓	✓
Phase Reversal	47					✓	✓	✓
Current Imbalance	46	✓	✓	✓	✓	✓	✓	✓
PTC Thermistor Monitoring	49		✓	✓	✓	✓	✓	✓
Starts / Hour	66		✓	✓	✓	✓	✓	✓
Time Between Starts	N/A		✓	✓	✓	✓	✓	✓
Speed Switch Input	14		✓	✓	✓	✓	✓	✓
Undervoltage	27						✓	✓
Overvoltage	59						✓	✓
Power Factor	55						✓	✓
Underfrequency	81L						✓	✓
Overfrequency	81I						✓	✓
Underpower	37						✓	✓
Reactive Power	N/A						✓	✓

Protection / Metering

Component Cross-reference Table

Discontinued Part Number	E3/E3 Plus Contactor Mounting/Description	E3/E3 Plus FLA Range	Recommended E300 Replacement Part Numbers	Conversion Notes
193-EC1PB	100-C09...100-C23	0.4 - 2.0A	193-ECM-DNT + 193-ESM-I-30A-C23 + 193-EIOxx-xx-xxx	Sensing Module current range is 0.5 - 30A
193-EC1AB	100-C09...100-C23, 300-A0*	1 - 5A	193-ECM-DNT + 193-ESM-I-30A-C23 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1AD	100-C30...100-C43	1 - 5A	193-ECM-DNT + 193-ESM-I-30A-C55 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1BB	100-C09...100-C23, 300-A0*	3 - 15A	193-ECM-DNT + 193-ESM-I-30A-C23 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1BD	100-C30...100-C43	3 - 15A	193-ECM-DNT + 193-ESM-I-30A-C55 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1CB	100-C09...100-C23, 300-A0*	5 - 25A	193-ECM-DNT + 193-ESM-I-30A-C23 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1CD	100-C30...100-C43	5 - 25A	193-ECM-DNT + 193-ESM-I-30A-C55 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1DD	100-C30...100-C43, 300-B0*, 300-C0*	9 - 45A	193-ECM-DNT + 193-ESM-I-60A-C55 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1DE	100-C60...100-C97	9 - 45A	193-ECM-DNT + 193-ESM-I-100A-C97 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1EE	100-C60...100-C97, 300-D0*	18 - 90A	193-ECM-DNT + 193-ESM-I-100A-C97 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1FF	100-D95...100-D180	28 - 140A	193-ECM-DNT + 193-ESM-I-200A-D180 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1GF	100-D95...100-D180, 300-E0*	42 - 210A	193-ECM-DNT + 193-ESM-I-200A-D180 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC1GG	100-D210...100-D420, 300-F0*	42 - 210A	193-ECM-DNT + 193-ESM-I-30A-T + 193-EIOxx-xx-xxx + 1411-180RL-201 (3 required)	No direct contactor mounting is available in E300 line
193-EC1HG	100-D210...100-D420, 300-F0*	60 - 302A	193-ECM-DNT + 193-ESM-I-30A-T + 193-EIOxx-xx-xxx + 1411-180RL-301 (3 required)	No direct contactor mounting is available in E300 line
193-EC1JG	100-D210...100-D420	84 - 420A	193-ECM-DNT + 193-ESM-I-30A-T + 193-EIOxx-xx-xxx + 1411-180RL-401 (3 required)	No direct contactor mounting is available in E300 line
193-EC1KH	100-D630...100-D860	125 - 630A	193-ECM-DNT + 193-ESM-I-30A-T + 193-EIOxx-xx-xxx + 1411-180RL-601 (3 required)	No direct contactor mounting is available in E300 line
193-EC1LH	100-D630...100-D860	172 - 860A	193-ECM-DNT + 193-ESM-I-30A-T + 193-EIOxx-xx-xxx + 1411-180RL-102 (3 required)	No direct contactor mounting is available in E300 line
193-EC1ZZ	Panel Mount Only	9 - 5000A	193-ECM-DNT + 193-ESM-I-30A-E3T + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300
193-EC2PB	100-C09...100-C23	0.4 - 2.0A	193-ECM-DNT + 193-ESM-IG-30A-C23 + 193-EIOxx-xx-xxx	Sensing Module current range is 0.5 - 30A
193-EC2AB	100-C09...100-C23, 300-A0*	1 - 5A	193-ECM-DNT + 193-ESM-IG-30A-C23 + 193-EIOxx-xx-xxx	Direct contactor mounting available with E300

E300 Supporting Information

- Tech Data (formerly Selection Guide):
  - https://literature.rockwellautomation.com/idc/groups/literature/documents/td/193-td006_-en-p.pdf
  - 193-sg010_-en-p.pdf (replaced by Technical Data)

- Quick Start Guide:
  - 193-qr004_-en-p.pdf

- User Manual:
  - https://literature.rockwellautomation.com/idc/groups/literature/documents/um/193-um015_-en-p.pdf

- Videos:
  - E300 on DeviceNet – E3/E3+ Emulation Mode Demonstration
  - E300 on DeviceNet – Entering Emulation Mode via the Operator Diagnostic Station
  - E300 New Parameter Backup/Restore Demonstration (Series B Only)
  - E200 and E300 Electronic Overload Relay Highlight Reel

- UL Listing Considerations when Modifying an MCC (KnowledgeBase Article 64042):
  - https://rockwellautomation.custhelp.com/app/answers/detail/a_id/64042

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E300 Supporting Information

- Expansion IO Modules and Power Supply:
  - https://rockwellautomation.custhelp.com/app/answers/detail/a_id/593132

- Using External Current Transformers with the E300 Electronic Overload Relay:
  - https://rockwellautomation.custhelp.com/app/answers/detail/a_id/616299/page/1

- E300 Overload Relay: CopyCat feature:
  - https://rockwellautomation.custhelp.com/app/answers/detail/a_id/620696/page/1

- E300 Output Relay Wiring Diagrams, Parameter Schemes in an LVMCC:
  - https://rockwellautomation.custhelp.com/app/answers/detail/a_id/977429/page/1

- E300 Overload Relay FAQ:
  - https://rockwellautomation.custhelp.com/app/answers/detail/a_id/1042104/page/1

- E300 Expansion Module Inputs assignments:
  - https://rockwellautomation.custhelp.com/app/answers/detail/a_id/1060989/page/1

- Firmware Release Notes on the RA PCDC (with multiple modules, E300 uses a "composite" firmware version):
  - https://netstorage.rockwellautomation.com/WebFiles/Products/PCDCDRA/Firmware/193-ECM-ETR/S40381/E300_Firmware_Release_Notes_(v7_180-v7_020-v7_004).pdf?rwtoken=1561353306_3115b847d07a926e9d5c88e2c33f4884

E300 Additional Resources

MCC Publications

- [2100-TD019](#) – DeviceNet MCC Technical Data
- [2100-SG003](#) – CENTERLINE 2100 Selection Guide
- [2100-CA004](#) – CENTERLINE 2100 Program Guide

E300 Publications

- [193-UM015](#) – E300 Electronic Overload Relay User Manual
- [193-TD006](#) – E300 Electronic Overload relay Specifications

Knowledgebase

- [TN1085462](#) – E300 Overload Relay with E3 Emulation Mode I/O Mapping
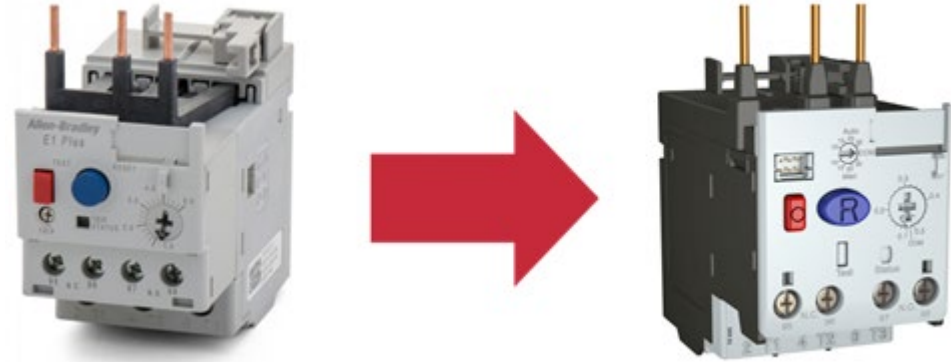- Coming soon – E3 Emulation Mode MCC Reference technote

E1 Plus to E100 LV MCC Migration

E1 Plus Overload Relay

December 2019 – End of Life Announced
April 2021 – Discontinued

Catalog Number	Product Description	Discontinued Date*	Recommended Replacement	Description
193-ED1, 193/592-EE, 193S/592S-EE	E1 Plus Electronic Overload Relay	Apr. 2021	193-1EE, 193/592-1EF	E100 Electronic Overload Relay

- E1 Plus Overload Relay
  - Introduced 18+ years ago
  - Recommend replacing with next generation E100 Overload Relays

- Web Pages
  - https://ab.rockwellautomation.com/Circuit-and-Load-Protection/LV-Motor-Protectors/E1-Plus-Overload-Relays
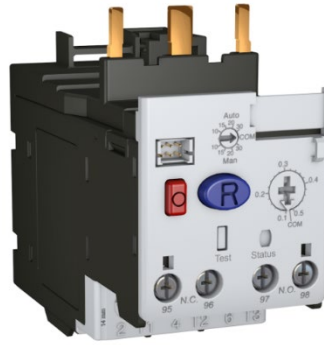 - https://ab.rockwellautomation.com/Circuit-and-Load-Protection/LV-Motor-Protectors/E100-Overload-Relays

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LV MCC E1 Plus Migration Path

E1 Plus Overload Relay
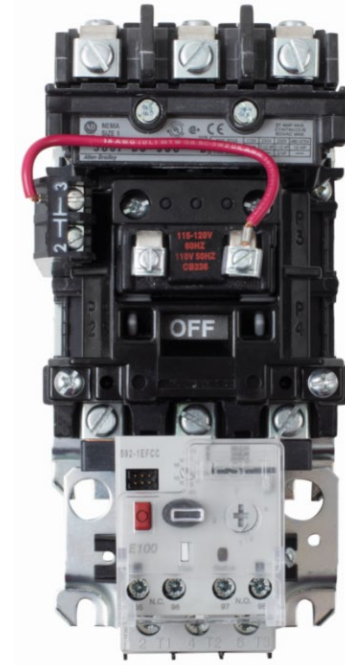
April 2021 Discontinuance Planned

- Communication Options
  - Side Mount Modules
    - Use with 193-EE version
    - EtherNet/IP
    - DeviceNet

E100 Overload Relay

- Communication Options
  - None at launch
  - Below EtherNet Linking Technology (Subnet) to be supported in future

Path forward:
For standalone applications, the E100 will provide the latest technology for a basic overload
For networked applications (both Ethernet and DeviceNet), the E300 overloads will provide network connection and a more advanced feature-set

E100 vs. E1 Plus

NEW E1 Plus to E100 Migration Guide

Migration Solutions

AB Allen-Bradley by ROCKWELL AUTOMATION

E1 Plus to E100 Electronic Overload Relay

Why Upgrade or Migrate

While the E1 Plus Overload Relay™ has been a valuable part of our portfolio for the past 18 years, this product will no longer be available for sale after April 2021.* Now is the time to migrate to the E100™ Electronic Overload Relay. The E100 is the next generation basic-tier electronic overload relay. It has enhanced features to better safeguard your motor investments, including increased accuracy and repeatability, a self-powered design with lower heat dissipation, and an aggressive component certification strategy.

E100 Basic Product Overview

- 193-1EE: Trip Class 10 and 20, manual reset only
- 193/592-1EF: Trip Class 10, 15, 20, 30, manual or automatic reset
- 5:1 wide current adjustment range to cover a variety of motor applications
- Supports both single- and three-phase operation in a single component
- A variety of accessories for enhanced protection
  – Ground fault/jam
  – Remote reset and/or indication
  – Anti-tamper shields
  – DIN rail/panel mounting

E1 Plus Electronic Overload Relay → *E100 Electronic Overload Relay*

Why Upgrade or Migrate?

Rockwell Automation understands that your overload relays are a critical asset in your automation system, and we support that by providing you with the latest technology to maximize your investment. New technologies can improve and extend the operation of existing equipment and provide an immediate boost to productivity. By migrating from your legacy E1 Plus Overload to a new E100 Electronic Overload Relay, you can help to decrease downtime, increase speed to market, and optimize operations well into the future.

We will help you to meet ever changing industry demands to innovate by proactively planning and managing your transition every step of the way to help you get the highest possible return on your automation investment.

ACTIVE* | ACTIVE MATURE* | END OF LIFE* | DISCONTINUED*

Migration Options & Application

The E100 Electronic Overload Relay was designed with migration in mind for customers looking to upgrade from a legacy E1 Plus solution.

- E100 improves application coverage with adjustable Trip Class 10 and 20 for the basic 193-1EE model
- Identical mounting footprint to E1 Plus for direct-mount configurations with Bulletin 100-C (IEC) and 500 (NEMA) contactors
- Equivalent overload performance, features, and wiring as compared to E1 Plus
- E100 offers optional accessory modules which can be front-mounted on Bulletin 100-C contactors for ease-of-access & minimizing panel space

	E1 Plus Overload Types	E100 Overload Types
Bulletin		
Model		
Type		
Rated Current (Range)		
NEMA Operating Voltage, No...		
IEC Operating Voltage, Nomi...		
Rated Operating Frequency		
Operating Temperature (ope...		
Overload Type		
Trip Class (Fixed)		
Trip Class (Adjustable)		
Reset Type		
Adjustment Range		
Rated Impulse Strength		
Phase Loss Protection		
Phase Imbalance Protection		

Component Cross-reference Table

Discontinued Part Number	E1 Plus Contactor Mounting/Description	E1 Plus FLA Range	Recommended E100 Replacement Part (or suggested alternative)	Replacement Category	Conversion Notes
193-ED1AB	100-C09...100-C23	0.1 - 0.5A	193-1EEAB	Direct	Direct contactor mounting available with E100
193-ED1BB	100-C09...100-C23	0.2 - 1.0A	193-1EEBB	Direct	Direct contactor mounting available with E100
193-ED1CB	100-C09...100-C23	1 - 5A	193-1EECB	Direct	Direct contactor mounting available with E100
193-ED1CP	Integrated panel/DIN Rail mount and pass-thru wiring	1 - 5A	193-1EECP	Direct	
193-ED1DB	100-C09...100-C23	3.2 - 16A	193-1EEDB	Direct	Direct contactor mounting available with E100
193-ED1DP	Integrated panel/DIN Rail mount and pass-thru wiring	3.2 - 16A	193-1EEDP	Direct	
193-ED1EB	100-C09...100-C23	5.4 - 27A	193-1EEEB	Direct	Direct contactor mounting available with E100
193-ED1ED	100-C30...100-C43	5.4 - 27A	193-1EEED	Direct	Direct contactor mounting available with E100
193-ED1EP	Integrated panel/DIN Rail mount and pass-thru wiring	5.4 - 27A	193-1EEEP	Direct	
193-ED1FD	100-C30...100-C43	9 - 45A	193-1EEFD	Direct	Direct contactor mounting available with E100
193-EEAB	100-C09...100-C23	0.1 - 0.5A	193-1EFAB	Direct	Direct contactor mounting available with E100
193-EEBB	100-C09...100-C23	0.2 - 1.0A	193-1EFBB	Direct	Direct contactor mounting available with E100
193-EECB	100-C09...100-C23	1 - 5A	193-1EFCB	Direct	Direct contactor mounting available with E100
193-EECD	100-C30...100-C55	1 - 5A	193-1EFCP	Engineered	No direct contactor mounting is available in E100 line
193-EECP	Integrated panel/DIN Rail mount and pass-thru wiring	1 - 5A	193-1EFCP	Direct	
193-EEDB	100-C09...100-C23	3.2 - 16A	193-1EFDB	Direct	Direct contactor mounting available with E100
193-EEDD	100-C30...100-C55	3.2 - 16A	193-1EFDP	Engineered	No direct contactor mounting is available in E100 line
193-EEDP	Integrated panel/DIN Rail mount and pass-thru wiring	3.2 - 16A	193-1EFDP	Direct	

E100 Supporting Information

- New Tech Data (formerly Selection Guide):
  - https://literature.rockwellautomation.com/idc/groups/literature/documents/td/193-td013_-en-p.pdf
- New User Manual:
  - https://literature.rockwellautomation.com/idc/groups/literature/documents/um/193-um013_-en-p.pdf
- New Installation Instructions:
  - 193-in081_-en-p, in082, in083, in084, in085, in086, in087, 592-in021_-en-e
- Videos:
  - COMING SOON!

Thank you