Product Description

Introduction

This document contains information for the Allen-Bradley Bulletin 1503VC IntelliVAC™ control module. The Bulletin 1503VC is used to control the Allen-Bradley Bulletin 1502 vacuum contactors that are a significant component of the Bulletin 1500/1900 CENTERLINE Medium Voltage Motor Controllers offered by Rockwell Automation. IntelliVAC is an efficient and flexible solution for controlling medium voltage vacuum contactors used in motor starter and feeder applications.

An IntelliVAC control module may also be provided as a loose OEM component, for use with a Bulletin 1502 contactor by a third party (OEM).

Scope

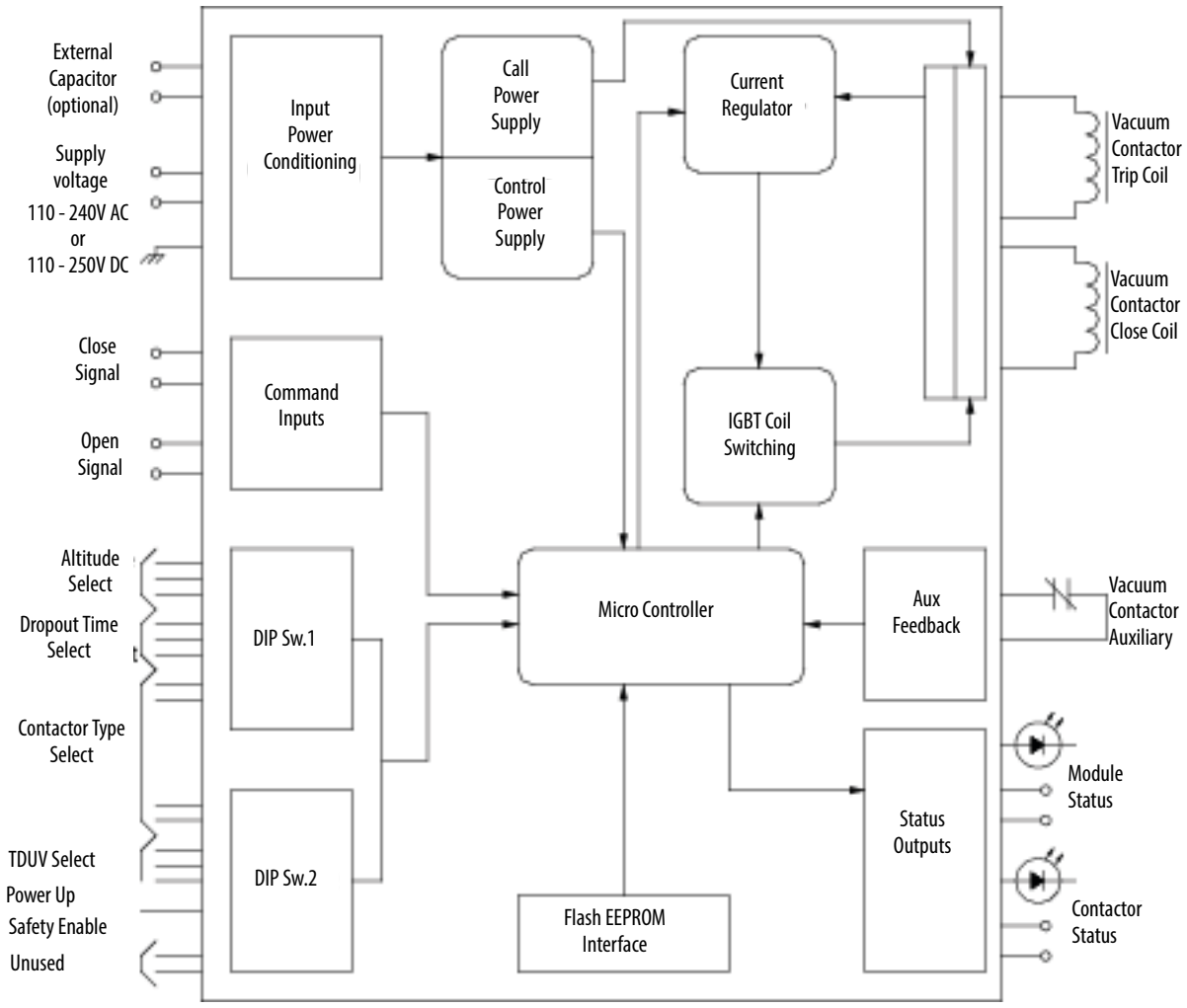
This document applies to the Series E version of IntelliVAC. See publication 1503-UM051C-EN-P for information related to the Series A and B designs, and 1503-UM052C-EN-P for information related to Series C and D designs.

Description

An IntelliVAC module may be used to control Bulletin 1502 400 and 800 Amp vacuum contactors. Both electrically held and mechanically latched contactor types can be controlled with IntelliVAC.

Figure 1 - IntelliVAC Contactor Control Module

Figure 2 - IntelliVAC Block Diagram



IntelliVAC Features

- A range of supply voltage (110 – 240V AC 50/60 Hz, 110 - 250V DC) allows implementation in multiple applications.
- Consistent vacuum contactor pick-up time (at a given supply voltage) ensures repeatable performance.
- Selectable vacuum contactor drop-out time improves coordination with upstream power fuses.
- Electronic altitude compensation (Bulletin 1502 400 A only) eliminates mechanical compensation required for altitudes above 1000 meters (Bulletin 1502 800 A contactors include a user-friendly mechanical altitude adjustment).

- Power loss ride-through (TDUV) allows the vacuum contactor to remain closed during short power loss (may require an optional external capacitor, dependent on ride-through time).
- Anti-kiss and anti-pumping protection ensure that the vacuum contactor close – open sequence occurs as expected, avoiding rapid reclosure due to faulty control devices.
- Delayed restart protects the vacuum contactor by ensuring that the rated duty cycle is not exceeded.
- Temporary jog function (electrically held contactors only) allows the motor to be positioned for process set-up.

IntelliVAC Versions

See Chapter 6 for part numbers of the various series of modules. The Series Letter is printed on the large label on the right-hand side of the enclosure, beside the part number.

Series A There are two versions of IntelliVAC control. The first type is used to control vacuum contactors that are electrically held, with one electrical coil that is economized electronically. The second is used to control mechanically latched vacuum contactors (no longer available).

Series B There is one version of IntelliVAC, to control electrically held and mechanically latched vacuum contactors (no longer available).

Series C Updated version of the Series B module (no longer available).

Series D Minor functionality (firmware) enhancements, primarily related to definition and handling of Faults and Warnings (no longer available).

Series E Revised hardware to allow connection to the IntelliVAC Plus or IntelliVAC MC. The removal of the mini Din connector for updating firmware (firmware is now updated using the IntelliVAC Plus or IntelliVAC MC boards). New input circuits to reduce thermal output, and decrease sensitivity to leakage current.

See Chapter 6 for catalog numbers for each version of IntelliVAC.

IMPORTANT	A Series C, D or E IntelliVAC module can be used to replace a Series A or Series B module. When replacing an older series of IntelliVAC with a newer one, note that the Module and Contactor Status outputs may function differently. See publication 1503-UM051C-EN-P and/or Chapter 5 of this document, and make any necessary changes to the control circuit.

Specifications

Mounting and Connections

The IntelliVAC control modules are mounted using two screws, see Figure 3 on page 12. They are typically located in the low voltage control panel of the medium voltage controller (Bulletin 1500/1900 controllers, in the case of Rockwell Automation).

IntelliVAC is interfaced to the Bulletin 1502 vacuum contactors using a “quick” connector, located at the module, a wire harness and “quick” connector at the contactor. Control power and other control circuit connections are similarly achieved with “quick” connectors.

Configuration

IntelliVAC is easily configured for a wide variety of medium voltage motor and feeder control applications. It is configured using DIP switches, located within the enclosure (front side). See Chapter 3 for information.

Bulletin 1500/1900 controllers are shipped with IntelliVAC preconfigured for the required application. Please see the documents provided with the order.

Firmware

IntelliVAC has firmware stored in flash EEPROM. This may be updated in the field (if necessary). The IntelliVAC board firmware is updated using either the IntelliVAC Plus, or IntelliVAC MC supplementary boards.

The firmware version supplied with the module is displayed on top of the DIP switches, see Figure 17 on page 31

Series C modules use only version 2.003 application firmware. This firmware is also compatible with the Series A and B modules. Series D modules use only version 3.001 or 3.002 application firmware.This firmware is **not** compatible with any other Series Letter modules. Series E modules use on 4.004 or newer firmware. This firmware is **not** compatible with any other Series Letter modules.

Table 1 - Electrical Ratings

Main Input Voltage (L1 … L2/N)	**AC – 110 … 240V rms, +10/-15%, 47 … 63 Hz** **DC – 110 … 250V, +10/-15%**					
	Description	**Contactor Ratings (Amps)**	**Control Voltage (AC or DC)**	**AC Rating**	**DC Rating**	**Minimum Voltage (V AC, 47…63 Hz)**
Main Input Current (L1 … L2/N)	Inrush Current	400/800	120/240	25 A peak (1/2 cycle)	25 A peak	
	Idle Current (Maximum without contactor coil energized)	400/800	120/240	125 mA	35 mA	
	Hold Current [3](maximum)	400/800	120/240	300 mA	100 mA	
	Close Current [3] (0.2 sec)	400	120	4.6 A	3.6 A	
			240	3.4 A	3.3 A	
		800	120	11.3 A	4.8 A	
			240	8.9 A	4.5 A	
	Trip Current (latch) [3] (0.2 sec)	400	120	7.0 A	3.7 A	
			240	3.6 A	2.0 A	
		800	120	7.0 A	3.3 A	
			240	4.3 A	1.9 A	
Minimum IntelliVAC Operational Supply Voltages	Pick-Up	400/800				95
	Drop-Out	400/800				75
	Trip (Mechanical Latch)	400				70
Command Inputs [1] [2]	AC – 70 … 240V rms DC – 70 … 250V Maximum on state current for open or close command: 11mA$_{AC}$ @ 276V AC, 60 Hz, T_A = 60 °C 2.4mA$_{DC}$ @ 276V DC, T_A = 60 °C Minimum on state current for open or close command: 2.5mA$_{AC}$ @ 70V AC, 60 Hz, T_A = 60 °C 1.2 mA @ 68V DC, T_A = 60 °C Maximum off state current for open or close command: 1.9 µA @ 60V AC, 60 Hz, T_A = 60 °C 900 µA @ 60V DC, T_A = 60 °C					
Status Output Contacts	AC – 250V rms, 5 A, R load; 2 A (reactive), PF = 0.4 DC – 30V, 5 A, R load; 2 A (reactive), L/R = 7 ms					
Standards and Approvals	CE, cULus, CSA, IEC pending					

(1) T_A = Ambient Temperature

(2) Ensure compatibility of IntelliVAC input ratings with those of circuit components activating these inputs.
Consider means of isolating/loading these signals, as required (using interposing relays or load resistors).
Consult factory for assistance, if required. The Series C and D IntelliVACs are compatible with most PLC outputs, and have been verified with Rockwell Automation OA type 120V triac outputs.
See Wiring Guidelines on page 22.

(3) Includes idle current.

Table 2 -

Table 3 - Mechanical Ratings

Temperature	Operating: 0 … 60 °C ambient at the control module (1)
	Non-Operating: -40… 85 °C
Altitude	-1000 … 5000 meters
Pollution	Pollution level II (as defined by UL 840 and IEC 60664-1)
Humidity	95% non-condensing
Shock (Operational)	15 g peak, 11 ms
Vibration (operational)	10 … 57 Hz, 0.015 inch displacement peak to peak 57 … 150 Hz, 2.5 g acceleration

(1) Ambient temperature is derated at altitudes above 1000 meters (3300 feet). See Chapter 1.

Table 4 - Altitude Derating

Altitude	Maximum Operation Ambient at the control module (°C)(1)
-1000 … 0	60
1 … 1000	60
1001 … 2000	58
2001 … 3000	56
3001 … 4000	54
4001 … 5000	52

(1) Derate by 2°C / 1000 m for high altitude operation.

Figure 3 - Mechanical Dimensions