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**OPERATION OF THE AV10R  
10 relay output device**

SOFTWARE VERSION DATE  
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## INTRODUCTION

The AV10R communicates on RS232 at 9600 N,8,1 baud and is non-addressable. With this format, the unit is "always on" but only one board can be on a serial line.

Easy to use commands give full control of the boards functions. Two levels of pre-timers allow adjustments to the main timer intervals from 10ms to 650.25sec for an effective relay timer range of 10ms to 45+ hours, plus on and off.

Easy connections are possible with screw type connectors for the I/O, a barrel connector for power and a phone style RJ11/12 connector for communications.

The AV10R has an onboard switching regulator for 9-35VDC operation, LED indicators for transmit and receive status for the serial communications. 13 jumpers are available for flow control, optional inputs and in-circuit programming.

The 10 relays are rated for 1.0A @ 30VDC.

## COMMAND DESCRIPTION

All communications are via RS232 with ASCII characters, and only capital letters are used. Characters "0"-"9" and "A"-"F" are used for (4-bit) hex data. While "G" through "Z" are used for commands.

A command string that is not formatted correctly is ignored.

## AVAILABLE COMMANDS:

1. "V"            The Version command is a single character command that causes the date of the software version to be returned in a 6 character string.
2. "I"            The I/O command is a single character command that returns the current settings of the output relays and the inputs. Four characters are returned which represent the status. Each character represents 4 bits of data. The first character is for relays K1-K4. Character number 2 is for relays K5-K8. Character number 3 is for relays K9 and K0, plus two un-used bits. Character number 4 is used for the inputs, with the msb. un-used followed by input data through Jumpers J6, J7 and J8. NOTE: The inputs are not available in the standard configuration. Removal of relays K5 and K6 is required for functionality of the inputs and must be requested at the time of ordering.
3. "T"            The Time command is a single character command that returns four characters that let you know what the pre-scale time bases are set at. The AV10R has two levels of pre-scale timers and are set with commands KBdd and KCdd. The first two characters represent the upper level pre-scaler and the last two characters represent the lower level pre-scaler setting.(see KBdd and KCdd)
4. "K"xddThe K command is used to set the interval of the relays timer. When x="1"- "9"or"0" and dd="01"- "FD" relay number x can be set with interval times of dd, for counts of 1-253. The actual time of an interval is determined by the values set in the upper and lower pre-scalers. (see KBdd and KCdd)
5. "K"x"00"        With this K command, relay x (x="1"- "9"or"0") is set to OFF.
6. "K"x"FF"        With this K command, relay x (x="1"- "9"or"0") is set to ON.
7. "K"x"FE"        With this K command, the current value of the interval for relay x (x="1"- "9"or"0") is returned. The response will be "K"xdd. If dd is "00" then the relay is off, if dd is "FF" then the relay is in the ON position and if any other value is returned then the relay is ON and is counting down. The value represents the remaining intervals of time. The KxFE command does not change the setting of relay x.
8. "KB"bb          The KB command is used to set the value of the upper level pre-scale timer. The value of pre-scaler B applies to all the timers interval time length. The value of bb can be "01"- "FF" for a 1-255 value. "00" will produce a count of 256. The four character response represents the new settings of pre-scalers B and C. The factory setting for bb is "64", 100 decimal. Changes are stored in non-volatile ram.
9. "KC"cc          The KC command is used to set the value of the lower level pre-scale timer. The value of pre-scaler C applies to all the timers interval time length. The value of cc can be "01"- "FF" for a 1-255 value. "00" will produce a

count of 256. The four character response represents the new settings of pre-scalers B and C. The factory setting for bb is "01", 1 decimal. Changes are stored in non-volatile ram.

### SETTING THE INTERVAL TIME:

The Kxdd command sets the number of intervals of time a relay will stay on for. However the amount of time is dependant on the settings of the two upper and lower pre-scale timers. (see above)

The base timer runs at a fixed .01sec interval.

The formula is: Total time=(dd \* bb \* cc \*.01sec),(+/-) 1 bb.

EXAMPLE: "KC01" sets cc to 1, decimal.

"KB64" sets bb to 100, decimal.

"K23C" sets relay K2 with 60, decimal.

$60 * 100 * 1 * .01 = 1 \text{ minute (+/- .01sec)}$

NOTE: Each interval is clocked by 16 bit independent timers (ddbb) and can be off by 1. In order to make the time as accurate as possible, always keep the value of cc as low as possible.

Switching the values of KCcc and KBbb would also produce a 1 minute time, but could off by 1 second instead of .01 second.

## JUMPER CONFIGURATION

Notes and abbreviations:

**I** = Install jumper (JX), **R** = Remove Jumper (JX), **XX** = Don't care

**\*** = Factory Default Setting for Jumper(s)

**Table 1: SERIAL RS-232 DEVICE TYPE**

<b>RS-232 MODE</b>	<b>J1</b>	<b>J2</b>	<b>J3</b>	<b>J4</b>
<b>* COMPUTER</b>	INSTALLED	INSTALLED	REMOVED	REMOVED
<b>MODEM</b>	REMOVED	REMOVED	INSTALLED	INSTALLED