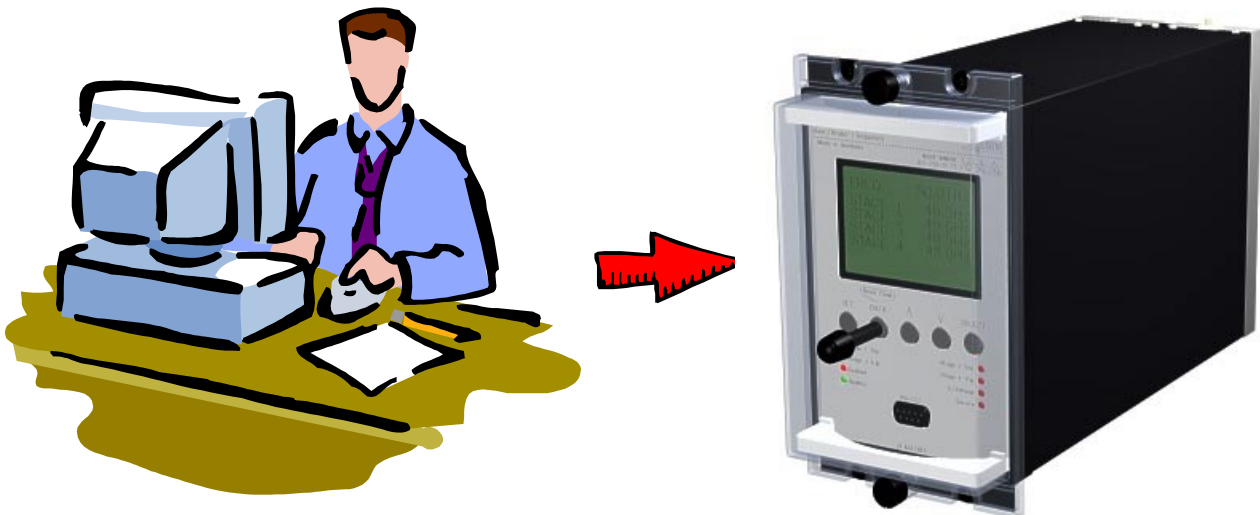


SOFTWARE FUNCTION & VERIFICATION

2V164 E UMX

VOLTAGE REGULATION & CONTROL RELAY



Issue	Date	Summary of changes
A	18/11/2002	Initial issue.
B	23/06/2003	UMX update..

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ARF	DG	DG	

3.0 DESCRIPTION – UMX2V164E.UMX

3.1 Standard Features

The 2V164 provides a range of standard features as described in the RMS Technical Bulletin which may be downloaded from:

www.rmspl.com.au/handbook/2v164.pdf

3.11 Voltage Section

Set point Voltage Range	90 - 130 in 0.25VAC Steps
Bandwidth Setting	0.5 - 5.0 in 0.25 VAC Steps
Coarse Bandwidth	1 - 20 in 1.0 VAC Steps
Over Voltage Setting Range	110 - 130 in 1.0 VAC Steps
Under Voltage Blocking Setting Range	60 - 100 in 1.0 VAC Steps
Hysteresis	50%

3.12 LDC

Current	1.0 or 5.0 Amp AC
Resistance	0 - 20 VAC in 0.1 VAC Steps
Reactance	0 - 20 VAC in 0.1 VAC Steps

3.13 Timer Section

Accuracy all timers	+/- 0.1 Seconds
Initial Time Delay	10 - 300 in 10second steps
Interval Time Delay	1 - 100 in 1second steps
Over Voltage Setting Range	1 - 60 in 1second steps
Under Voltage Blocking Setting Range	0 - 60 in 1second steps
Coarse Bandwidth	0 - 60 in 1second steps
Tap Change Fail	10 - 300 in 10second steps
Timing Characteristic	Definite or Inverse

3.14 Load Step Inputs

2 Load Step Inputs	-10% to -10% in 0.5% steps
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3.15 Overcurrent Blocking

Current	50 - 150% in 5% steps
Time	0 – 60 seconds in 1s steps

3.2 Special Features of this Software UMX Version

TPI feedback mode:

When a tap raise or lower command is output by the 2V164 to the OLTC, the internal tap change fail timer is started. Feedback from the OLTC is required to reset this timer. One of three methods may be used depending on the requirements of the control system. This 'E' UMX was primarily conceived for use in RMS's 1M122 Parallel Control Scheme. *For information on the standard methods, see the 2V164 data sheet or the UMX2V164x documents.*

UMX2V164E OLTC AUXILIARY CONTACT METHOD

In this mode a normally closed auxiliary contact on the OLTC is required & must open for at least one (1) second during a tap change operation. This contact is wired back to the 2V164 relay & applies a control voltage to the tap change feedback status input. The control sequence is as follows:

1. A voltage deviation starts the initial time delay.
2. The time delay expires & a tap change "pulse" command is output.
3. The tap change contact will close for a one second pulse. The interval time delay is displayed but will only commence once a command is received on the 2V164 tap change feedback status input.
4. The interval time delay is initiated.
Sequence 2 to 4 will repeat at the rate determined by the Interval timer setting until the sensed voltage falls back to within pre-set bandwidth limits.

4.0 USER INTERFACE

Refer to the μ MATRIX Users Guide for detailed instructions on the operation of the user interface.

To download a PDF version of the guide:
www.rmspl.com.au/digital/uMATRIXInfo.pdf

To download further μ MATRIX software & documentation:
www.rmspl.com.au/uMATRIX.htm

5.0 Loading software, Calibration & Test

This section requires at least the following:
A PC with Windows 98 or later and at least one COM port.
UMatrixWin software.
The correct serial cable.
The ability to interrogate the relay via the front panel buttons.
A general understanding of how UMX and UMP files work with the relay.

Settable parameters will be overwritten by loading a new UMX file. They can however, be saved to a UMP file and then returned to the relay later. To learn how to do this, refer to the uMatrix Userguide.

5.1 Loading the UMX

Before loading the UMX2V164E software, ensure that it is compatible with your hardware. Download the compatibility list from the RMS website at:

www.rmspl.com.au/digital/compatibility.pdf

Now ensure that the bios version in the relay matches the table in section 2.0 of this document. (If the bios version is different, you may not be able to load this UMX. Contact RMS for support.)

Load the UMX via the front panel COM port using the 'uMatrixWin' software. Now ensure that the UMX version matches the table in section 2.0.

To interrogate for versions, press 'SET' and 'DATA' buttons simultaneously, then select 'Version Page'. Alternatively, use uMatrixWin – Options – Utilities.

Check versions

The relay is now ready to calibrate. *Note: calibration is a factory function. If you are simply changing or re-loading a UMX, re-calibration is not necessary. The relay is deemed to be fully operational.*

5.2 Calibration using 'WinCal'

Test equipment required:

As 5.0 plus

Calibrated Test Set (Volts, Amps, Timing & Phase Angle)

- a) With the test set and PC connected to the relay, start Wincal, select uMatrix – Connect.
- b) Select uMatrix – Calibrate and follow the prompts. When completed, verify the following parameters.
- c) Check Voltage display reading accuracy:

MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
119.8	120.2	120.0	<input type="text"/>	VDC
MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
109.8	110.2	110.0	<input type="text"/>	VDC
MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
99.8	100.2	100.0	<input type="text"/>	VDC

- d) Check current display reading accuracy:

MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
0.19	0.21	0.20	<input type="text"/>	Amps
MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
0.49	0.51	0.50	<input type="text"/>	Amps
MINIMUM	MAXIMUM	NOMINAL	ACTUAL	UNITS
0.99	1.01	1.00	<input type="text"/>	Amps

5.3 Optional Analogue Output Verification

Does not exist in all hardware variants.

- a) With the Line voltage set to 110V there should be 16.1+/-0.1mA between terminals 49 and 51.

VERIFY

- b) With the TPI set for 1 there should be 4.7 +/-0.1mA between terminals 53 and 55 and with the TPI set to 30 there should be 20.0 +/-0.1mA between terminals 53 and 55.

VERIFY

If the relay settings in the above are correct, the relay is deemed to be fully operational.

TESTED BY : _____ DATE : _____

6.0 CONNECTION DIAGRAM

