

## SOFTWARE FUNCTION & VERIFICATION

# 2H34 B UMX

### FREQUENCY RELAY



Issue	Date	Summary of changes
A	05/06/2002	Initial issue.
B	10/10/02	Document layout changed

Due to RMS continuous product improvement policy this information is subject to change without notice.  
 This document is uncontrolled and subject to copyright.

Author	Checked & Registered	.pdf file created	Released
ARF	MW	MW	



### 3.0 FUNCTIONAL DESCRIPTION – B UMX

#### 3.2 Standard Features

The 2H34 provides a range of standard features as described in the RMS Technical Bulletin which may be downloaded from:

[www.rmspl.com.au/handbook/2H34.pdf](http://www.rmspl.com.au/handbook/2H34.pdf)

##### 3.1.1 Frequency Set Points

Inputs:	63.5 or 110V AC
Setting stages:	4 independent stages
Setting range:	40 to 70Hz
Setting resolution:	0.05Hz (0.01Hz in $\mu$ MATRIXwin)
Accuracy:	+/-0.03Hz (70 to 121V) +/-0.10Hz (30 to 69V) +/-0.50Hz (14 to 29V)
Hysteresis:	0.05 to 0.5Hz
Frequency measuring time:	60ms (3 cycles)
Error in response time:	<5ms
Minimum operate time:	70ms (Including output relay delay)
Overfrequency function:	PU at set point DO at set point – hysteresis
Underfrequency function:	PU at set point DO at set point + hysteresis
Undervoltage lockout:	20 to 90V
Setting resolution:	0.1V steps

##### 3.1.2 Rate of Change of Frequency (df/dt) Set Points

Inputs:	Operates on frequency inputs
Setting stages:	4 independent stages
Setting range:	0.02 – 1.25Hz/s in 0.01Hz/s steps
Accuracy:	+/-0.03Hz (70 to 121V) +/-0.10Hz (30 to 69V) +/-0.50Hz (14 to 29V)
Hysteresis:	0.05 to 0.5Hz/s in 0.05Hz/s steps
Frequency measuring time:	40ms to 1,000ms in 40ms steps
Over df/dt function:	PU at set point DO at set point – hysteresis
Under df/dt function:	PU at set point DO at set point + hysteresis

##### 3.1.3 Setting Frequency Stages

The 2H34 relay provides four independent frequency setting stages as follows:

- a) Set under or over frequency detection
- b) Frequency set point
- c) Time delay
- d) Frequency reset hysteresis
- e) Frequency reset time delay
- f) Rate of frequency (df/dt) set point
- g) Rate of frequency hysteresis
- h) Rate of frequency reset time delay

### 3.1.2 Relay Enable

A status input is provided to place the 2H34 in an enabled or inhibited condition.

#### Status Input Sense

The status input may be user configured such that application of a control voltage will enable the relay (Relay normally inhibited).

Alternatively the status input may be user configured such that removal of a control voltage will enable the relay (Relay normally enabled).

#### 2H34 Enabled

The stage start conditions are only active when while the 2H34 relay is enabled. When the **A** UMX is installed, the "enable" output relay and front panel LED will pickup when the 2H34 is enabled.

#### 2H34 Inhibited

The stage start conditions are not active when the 2H34 is inhibited. The undervoltage lockout function remains active to detect loss of the input signal.

### 3.1.3 Undervoltage Lockout

The 2H34 provides an Undervoltage lockout signal to automatically inhibit stage start conditions, which may be caused due to loss of the input signal. Settings are as follows:

- a) Undervoltage set point
- b) Time delay

#### Undervoltage Start

The time delay is initiated when the undervoltage set point is reached.

#### Undervoltage Time Out

Provided this start condition is maintained for the duration of the pre set time delay, the undervoltage output contact will pick up and the front panel LED indicator illuminated. While the undervoltage contact is picked up all stage start signals are inhibited.

#### Undervoltage Lockout Reset

The output contact and LED indication is self-reset once the start condition is removed.

### 3.2 Special Features of this Software UMX Version

The stage time delay is initiated when the frequency set point and the df/dt set point is reached.

#### 3.2.1 The interaction of the frequency threshold and the df/dt setting is specific to the B UMX:

##### AND Logic B UMX Firmware using $\mu$ MATRIXwin

###### Stage Start

The stage time delay is initiated when both the frequency set point and the df/dt set point is reached.

###### Stage Time Out

Provided the start condition is maintained for the duration of the pre set time delay, the stage output contact will pick up and the front panel LED indicator is illuminated. The output contact is self-reset once the start condition is removed.

###### Stage Output Reset

Reset of the start condition is determined by the hysteresis and the reset time settings. For a stage configured as under frequency detection, reset will occur at the set point plus the hysteresis setting once this condition has been maintained for the duration of the reset delay.

###### Stage Flag Reset

The LED indicator is latched and may be reset at the front panel using the reset button, remotely via the reset flag status input, via the programming port using  $\mu$ MATRIXwin or via the SCADA port.

###### Common Output Pulse

An additional relay provides a pulse output of programmable duration when any of the four output stage relays pick up. Refer to the wiring diagram for the output relay used.

## 4.0 USER INTERFACE

Refer to the  $\mu$ MATRIX Users Guide for detailed instructions on the operation of the user interface.

To download a PDF version of this guide:  
[www.rmspl.com.au/digital/uMATRIXInfo.pdf](http://www.rmspl.com.au/digital/uMATRIXInfo.pdf)

To download further  $\mu$ MATRIX software & documentation:  
[www.rmspl.com.au/uMATRIX.htm](http://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 UMX2H034B 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](http://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 frequency display reading accuracy:

<b>@110VAC</b>	<b>MINIMUM</b>	<b>MAXIMUM</b>	<b>NOMINAL Hz</b>	<b>ACTUAL A</b>	<b>ACTUAL B</b>	<b>ACTUAL C</b>
	49-97	50.03	50.0			
<b>@50VAC</b>	<b>MINIMUM</b>	<b>MAXIMUM</b>	<b>NOMINAL Hz</b>	<b>ACTUAL A</b>	<b>ACTUAL B</b>	<b>ACTUAL C</b>
	49.90	50.10	50.0			
<b>@20VAC</b>	<b>MINIMUM</b>	<b>MAXIMUM</b>	<b>NOMINAL Hz</b>	<b>ACTUAL A</b>	<b>ACTUAL B</b>	<b>ACTUAL C</b>
	49.50	50.50	50.0			

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

TESTED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

7.0 CONNECTION DIAGRAM

