

# 2V164I Software

## Voltage Regulating & Control Relay

relay monitoring systems pty ltd

### **Advanced Protection Devices**



User Guide



Test Manual



Relay Software



µMATRIXwin

# 2V164I Relay Software

## Links to Other Documents

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User Guide: [http://www.rmspl.com.au/userguide/2v164\\_user\\_guide.pdf](http://www.rmspl.com.au/userguide/2v164_user_guide.pdf)

Software Downloads: <http://www.rmspl.com.au/digital/umatrix.htm>

## Version Control

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Issue	Date	Summary of changes
F	07/12/2009	UMX updated
G	01/04/2010	UMX updated.
H	07/02/2011	Inhibit and LDC inputs are now segregated (CR0991)
D	06/08/2007	UMX updated
E	21/08/2009	UMX updated

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ARF	DG	DG	



## 1.0 OVERVIEW

The 2V164 Voltage Regulator Relay continuously monitors the transformer output voltage & current. It provides "RAISE" & "LOWER" control commands to the on-load tap changer such that the load centre is automatically maintained within acceptable limits. Small variations in supply frequency will not affect the system performance.

The 2V164 relay is built on the Micro MATRIX digital platform. The standard Micro MATRIX human machine interface (HMI) is combined with fully solid-state voltage sensing & measuring circuitry to provide high accuracy, simple set up & flexible operation. Self-monitoring is carried out by hardware & software watchdogs.

The TPI inputs, output relays & opto isolated status inputs form the essential barriers against high voltage line transients while a switchmode auxiliary supply provides a wide operating range.

A programming port is provided for ease of establishing relay settings using a PC &  $\mu$ MATRIXwin.

## 2.0 SOFTWARE VERSION CONTROL REGISTER

The following table is a register of the changes for the **UMX2V164G.umx** file.

DATE	SOFTWARE	CHANGES	BIOS	FIRST HARDWARE
30/05/2003	05.00	Initial release	05.xx	2V164K1
03/06/2003	05.01	Add alternate LDC setting group & T/C F/B mode.	05.xx	
25/06/2003	05.02	Modified delay timing reset Added TC Status page	05.xx	
29/06/2007	05.10	TC Data page text added	05.xx	
17/08/2009	05.11	Update Phase correction algorithm	05.xx	
07/12/2009	05.11	Set MAXTAPS lower limit to 2	05.xx	
29/03/2010	05.30	CR0924 - Improve Current channel linearity	05.xx	



### 3.0 DESCRIPTION – UMX2V164I.UMX

#### 3.1 Standard Features

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

[www.rmspl.com.au/handbook/2v164.pdf](http://www.rmspl.com.au/handbook/2v164.pdf)

#### 3.2 Special Features

The 2V164 I UMX is primarily for use with the RMS 1M122[A] Parallel Control Scheme.

##### 3.2.1 Tap Change Feedback Mode

Status input 6 is used by the 2V164I UMX to detect if the 1M122[A] Parallel Control Sub Rack it is fitted to is set to MASTER or INDEPENDENT mode. The tap change feedback operates in two ways depending on the status of this input as follows:

##### 1M122[A] Set to MASTER Mode

When a voltage error is detected, the 2V164 will trigger the Initial Delay Timer. The Initial Delay Timer will start counting down provided the Tap Change Feedback input is true.

A normally closed contact on the 2V165 Parallel Control Relay is used to provide this signal. When a tap change is in progress, the signal is removed causing the 2V164 interval time delay to pause until the tap change step is completed.

The control sequence is as follows:

1. A voltage deviation starts the 2V164 initial time delay provided the Tap Change Feedback input is true.
2. The time delay expires and a tap change "pulse" command is output by the 2V164.
3. The 2V165 detects that a tap change step is in progress and removes the tap change feedback signal.
4. The 2V164 interval time delay is displayed, but does not start counting down.
5. When the 2V165 signals the 2V164 that the previous tap change step is complete, the interval time delay is initiated.
6. Sequence 2 to 5 will repeat at the rate determined by the Interval timer setting until the sensed voltage falls back to within pre-set bandwidth limits.

The default Tap Change Feedback status input is "Apply Volts" to initiate the timer.

##### 1M122[A] Set to INDEPENDENT Mode

1. A voltage deviation starts the initial time delay.
2. The time delay expires & a tap change command *pulse* is output.
3. The interval time delay will be paused until a signal is received from the TPI transducer confirming that a tap change event has occurred.
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 moves back to within pre-set bandwidth limits.

##### 3.2.2 Tap Position Display

The tap position is always displayed on the DATA PAGE.

##### 3.2.3 Tap Change Output Commands

The tap change output is signalled via a clean RAISE or LOWER contact pulse of user defined duration. The default duration is 2s.



#### 3.2.4 Alternate LDC Setting Group

An alternate group (LDC 2) for LDC resistance and reactance settings may be entered into the LDC menu with this UMX. Status Input 5 (SI5 on the wiring diagram), is used to toggle between the LDC setting groups.

When the LDC 2 Group is selected output contact 7 will pick up to signal this operational mode.

When an LDC mode is selected (Other than OFF), the message:

**\*\* LDC Group 1 \*\* or \*\* LDC Group 2 \*\*** is displayed on the HMI as determined by the SI5 input status.



#### 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 the guide uMatrix: [www.rmspl.com.au/digital/umatrixinfo.pdf](http://www.rmspl.com.au/digital/umatrixinfo.pdf)

To download a PDF version of the guide uMatrix-S: [www.rmspl.com.au/digital/umatrix-s\\_info.pdf](http://www.rmspl.com.au/digital/umatrix-s_info.pdf)

To download USB VCP drivers for uMatrix-S: [www.rmspl.com.au/umatrix.htm](http://www.rmspl.com.au/umatrix.htm)

#### 5.0 LOAD SOFTWARE

Loading a UMX requires at least the following:

A PC with Windows 2000 or later and at least one COM (uMatrix) or USB (uMatrix-S) port.

*(Note: USB comms require drivers to be installed on your PC. See section 4.0 downloads.)*

UMatrixWin software.

The correct communications cable.

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 UMX2V164I 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

#### 5.2 Customer Default UMP

Load customer UMP file as per the Job Card. If no UMP file is requested, write N/A in check box.

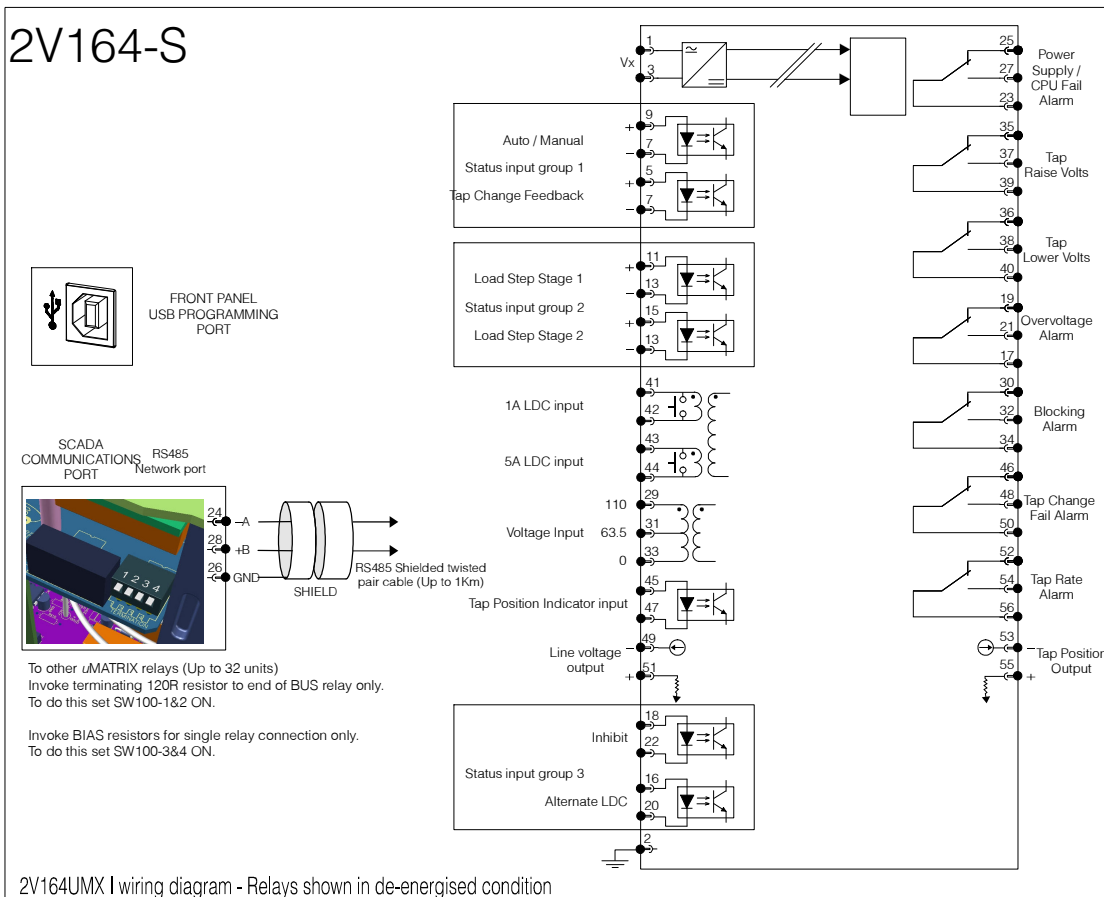
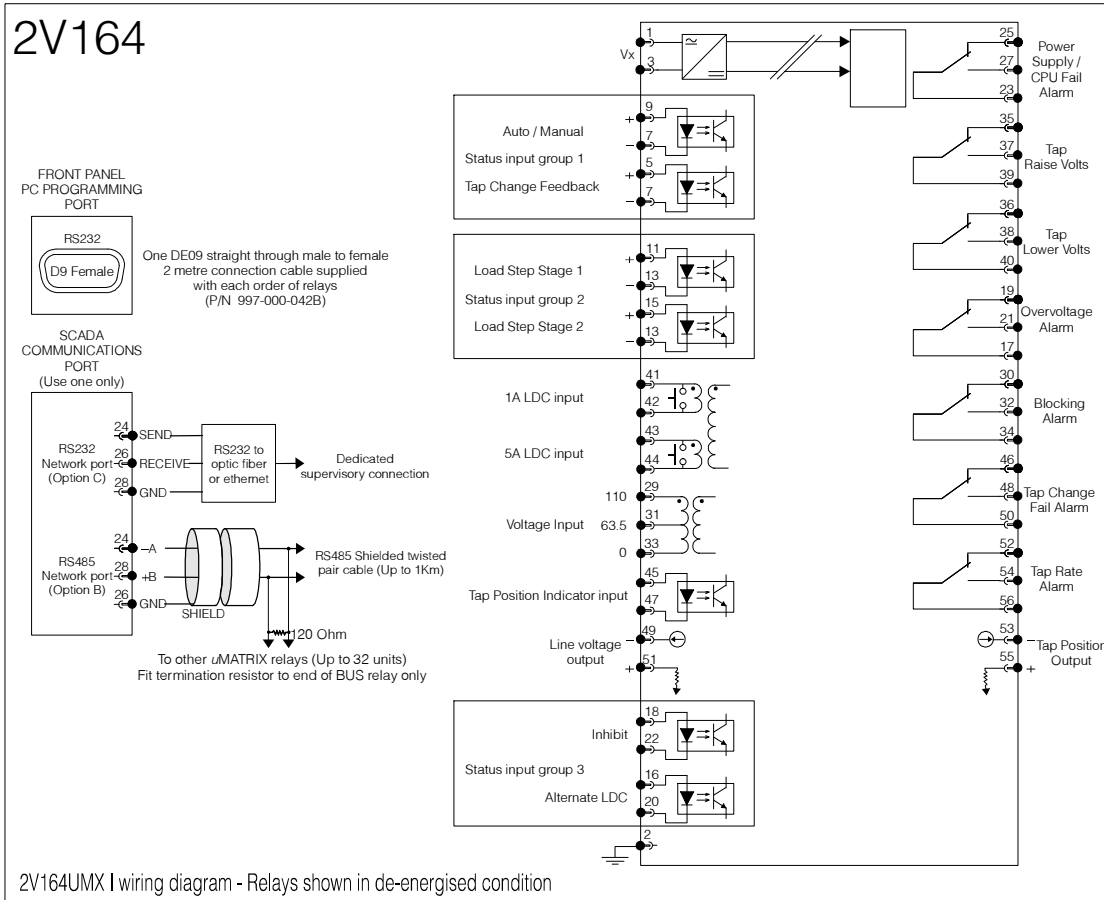
UMP file name

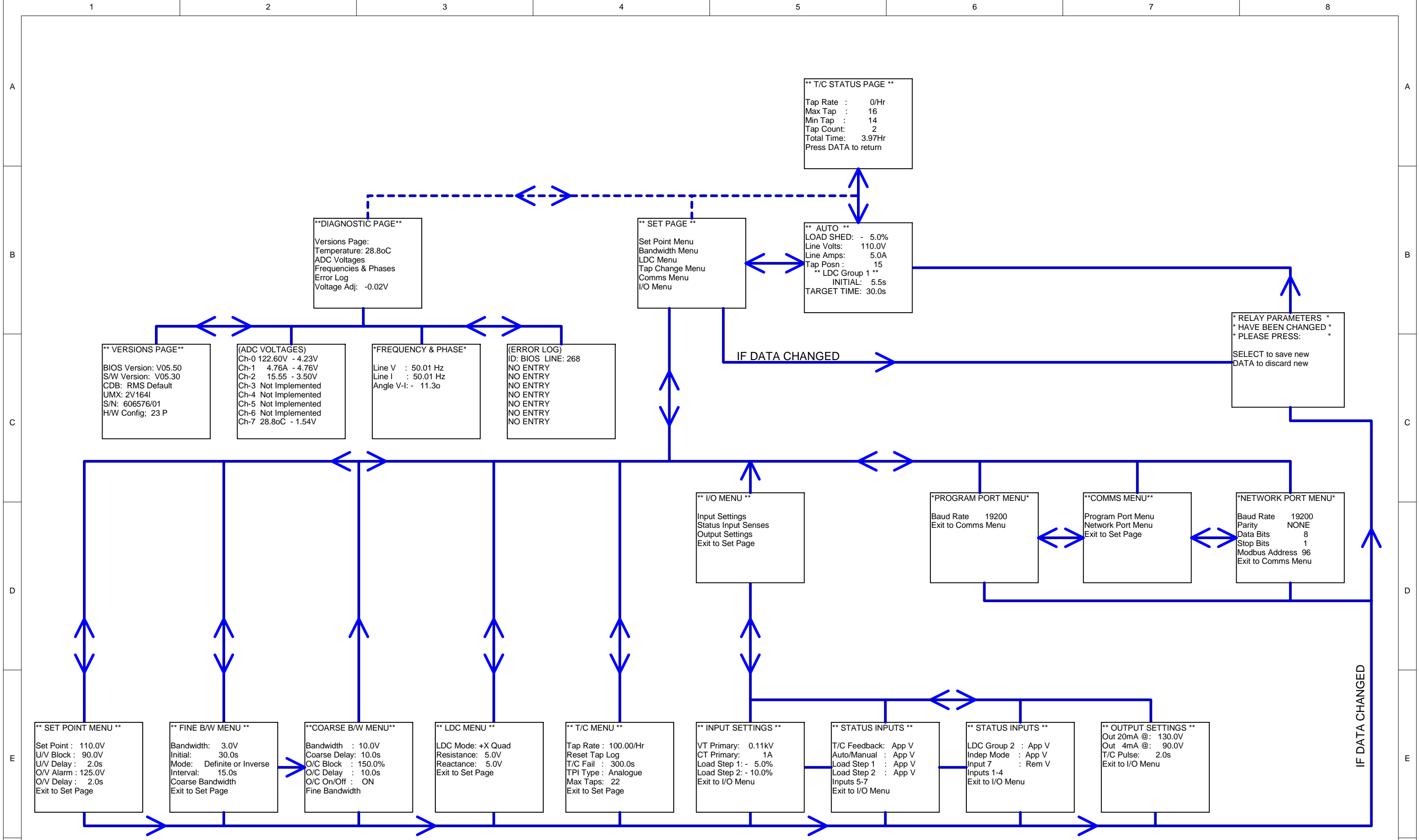
The Relay is now ready for field use.

SOFTWARE INSTALLED BY :

DATE :

6.0 CONNECTION DIAGRAM





MATERIAL: See N.A.		for Materials List		FINISH: N.A.		Cannot open file D:\THE_CHIP\RMS\LIBRARIES\PROTEL_98\SCHEMATIC\logo.wmf		This document is copyright to Relay Monitoring Systems PTY LTD and may not be copied or used without prior written consent.		<i>Uncontrolled UDocument</i>		USE ONLY FOR JOB No. J/N:	
Unless otherwise stated: SMD Resistors are 1/8W 1% 0805 Metal Film SMD Capacitors <100P are 50V 0805 NPO SMD Capacitors >100P and < 1n0 are 100V 0805 NPO SMD Capacitors >1n0 and < 1u0 are 50V 0805 X7R				www.rmspl.com.au		TYPE No. 2V164I (PULSE FEEDBACK, PULSE T/C)		MENU STRUCTURE		V05.30		SHEET: 1 OF: 1	
DRAWN		DATE		SHEET: A3		SCALE: D.N.S		2V164_I_MENU_0530				RMS-A3.SCHDOT Iss A 3rd Angle projection	
D.W.B		29/03/2010		L:\ENG\Projects\2v164-s\Firmware\Specification\2V164_I_MENU_0530.schdoc									