

DataMate 8330 WX

*Register Access Panel
for
Westinghouse
PC-700/900/1100 PLC's*

Product Manual

**PLEASE READ THIS MANUAL BEFORE INSTALLING
AND/OR USING THE DATAMATE PRODUCT**

QUARTECH

Corporation

PM-8330WX
Rev. 1

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1. INTRODUCTION

The DataMate 8330 (WX) is a Register Access Panel specifically designed for use with Westinghouse PC-700/900/1100 PLC's. The 8330 (WX) communicates in RS-232-C utilizing the Numa Logic 6 byte protocol thus allowing it to interface directly with the PC-700/900/1100 controllers.

Operating in the "Open Mode" the 8330 (WX) can view and modify all of the Holding Registers (HR). Operating in the "Enhanced Mode" allows the system programmer to restrict the DataMate to view and/or modify a specific block of registers and also limit the write values. The addition of security locks, display segment control and program initiated error codes makes the DataMate 8330 (WX) the perfect choice for many control applications.

2. GETTING STARTED

Every effort has been made to make the DataMate 8330 (WX) a simple product to apply and operate. Sometimes the best way to learn the operation of a new product is to hook it up and play with it. If this is your philosophy, then here's what to do.

1. Plug the 8565-10 communications cable (or equivalent) between the DataMate 8330 (WX) and the programmable controller.
2. Set all dip switches on the DataMate to the off position.
3. Apply AC power to the programmable controller.
4. Connect the 8550 Power Supply (5 VDC at 1 AMP) or equivalent to the DataMate.
5. Apply AC power to the Power Supply.

```
*****  
* CHECK THE VOLTAGE AT THE TERMINALS LOCATED ON THE DATAMATE AND *  
* ADJUST VOLTAGE WITH DATAMATE TO 5.1 - 5.2 VDC WHILE UNIT IS ON. *  
*****
```

6. Proceed to the section titled OPEN MODE OPERATION (page 6).

3. KEY DEFINITIONS

LOCK Assuming CLOC is selected: If unit is currently unlocked pressing the "LOCK" key will immediately lock the keypad and "CLOC" will be displayed.

If the unit is currently locked the "LOCK" key must be pressed after all digits of the combination are entered to unlock the keypad. See Security Locks for more detail.

NEW REG Operates as the REGISTER NUMBER enter key and if unit is in the "REGISTER DATA" mode pressing this key will toggle the unit to the "REGISTER NUMBER" mode.

This key will function in two different ways depending upon the setting of Dip Switch A6.

When Dip Switch A6 in ON, the NEW REG key will function in an Auto Increment Mode. Let us assume that a register number has been entered, the contents of that register is being displayed and the "REGISTER DATA" LED is ON; pressing the NEW REG key will toggle the display showing the register number currently being accessed. Two options are now available to the operator: 1) Pressing the NEW REG key a second time will increment the register number by one. If the High Read Limit is reached, the DataMate will jump back to the Low Read Limit.

The new address will be displayed for approximately one second. The DataMate will toggle to the Register Data mode and display the contents of that register. 2) Pressing the CLR key will clear the display and the DataMate is now ready for a new register number to be entered.

When Dip Switch A6 is OFF, the NEW REG key will functions in an ENTRY READY Mode. Let us assume that a register number has been entered, the contents of that register is being displayed and the "REGISTER DATA" LED is ON; pressing the NEW REG key will toggle the display back to the "REGISTER NUMBER" mode and clear the display. The DataMate is now ready for a new register number to be entered.

NEW DATA	Operates as the "REGISTER DATA" enter key and if the unit is in the "REGISTER NUMBER mode, pressing this key will toggle the unit to the "REGISTER DATA" mode. This key is also used to enter new data once the existing value has been cleared by pressing the CLR key.
- CLR	Negative key - does not function on this unit. Clears the display and key entry buffer which allows a new REGISTER NUMBER or new REGISTER DATA to be entered.
VIEW	Pressing this key will toggle the unit from REGISTER DATA mode to REGISTER NUMBER mode or vice versa until the key is released.
LAST ENT	Pressing this key allows the operator to view the last data sent to the controller or the last REGISTER NUMBER entered depending upon the mode the unit is in. Releasing the key returns the unit to its previous condition.

4. MODE INDICATORS

Three LEDES are located just below the display window and indicate the current 8330 operating mode and status.

During normal operation the REGISTER NUMBER LED being on indicates the value in the display window is a Register Number. If an error code is in the display it is Register Number related.

During normal operation the REGISTER DATA LED being on indicates the value in the display window is the Numeric content of a register. If an error code is in the display it is data related.

The REGISTER NUMBER and REGISTER DATA LEDS will never be on at the same time. When the KEYBOARD LOCKED LED is on, the keypad is inactive unless "CLOC" is being displayed. During that time only a formatted entry relative to the combination entry is accepted.

5. OPEN MODE OPERATION

In its default mode of operation, referred to as OPEN MODE (dip switches B6 - C8 OFF), the DataMate 8330 (WX) can view and modify any of the holding registers. On initial power up, the DataMate 8330 (WX) will display 2-X-X. The 2 indicates a Westinghouse compatible executive. The next two digits indicate the version level. During this display, default parameters are set and diagnostics are performed. If successful, the display will blank except for a cursor in the right most character position. The REGISTER NUMBER LED will be ON. This will further be referred to as the Register Number Ready mode. The operator may now enter a register number.

If the operator enters a register number that is higher than the highest register used in either the OPEN or ENHANCED mode the 8330 (WX) will display -HI- and set the "REGISTER NUMBER" LED to ON. Pressing the "CLR" key will clear the message and set the unit to the REGISTER NUMBER ready mode.

Once the desired register has been entered, the operator must press the NEW REG key. The REGISTER NUMBER LED will turn OFF, the REGISTER DATA LED will turn ON and the display will show the numeric content of the register entered. The register is continually read offering real time display. At this point four keys are active on the keyboard, LAST ENT, VIEW, CLR and NEW REG. They function as follows:

- LAST ENT When pressed, the display will show the last data value entered by the operator. If no value has been entered by the operator, the display will show "0". The display will continue as long as the key is held down.
- VIEW When pressed, the REGISTER DATA LED will turn OFF, the REGISTER NUMBER LED will turn ON and the display will show the register number currently accessed. When the key is released, the DataMate will return to the REGISTER DATA display mode.
- CLR When pressed, the display will blank except for a cursor in the right most digit position. This is referred to as the Register Data Ready mode. The operator may key in a new value. Once the new value has been keyed in, the operator may press NEW DATA to send the new value to the PLC.
- NEW REG The DataMates response to this key is dependant on the setting of switch A6. Assume A6 is off. When pressed, the DataMate will go to the REGISTER NUMBER ready mode with a cursor in the units position. If ON, the NEW REG key will function in an Auto Increment Mode. (Refer to Section 3 for more detail.)

Assuming the operator presses the NEW REG key, the DataMate will go to the register number ready mode. The operator may key in a new register number, then press NEW REG to view its contents or press one of three active function keys LAST ENT, VIEW or NEW DATA. The DataMate response to the three function keys as follows:

LAST ENT When pressed, the display will show the last register number that was entered by the operator (at this point it is still the current register being accessed). When released, the DataMate will return to the register number ready mode.

VIEW When pressed, the REGISTER NUMBER LED will turn OFF and the REGISTER DATA LED will turn ON. The display will show the contents of the currently accessed register. When released, the DataMate will return to the register number ready mode.

NEW DATA When pressed, the REGISTER NUMBER LED will turn OFF and the REGISTER DATA LED will turn ON. The display will show the contents of the currently accessed register.

The LAST ENT and VIEW keys are always active in open mode. These keys are both momentary and when pressed simply point the display to various display buffers and have no affect on the data. Pressing either of these keys during the middle of data entry will not affect the data in any way.

The CLR is always active in open mode. Pressing the CLR key simply clears the DataMate key entry buffer, it does not change any data. If the CLR key is pressed accidentally, recovery requires pressing either the NEW REG or NEW DATA key (opposite key to mode DataMate is then in).

NOTE: The LOCK key is never active in open mode.

Example: Assume that you want to change the data value of register HR127 from 0 to 4887.

1. With the 8330 WX in the register number mode (Register Number LED ON and a cursor is the least significant digit position), press the keys 1, 2 & 7. The display will show each number as it is entered with the cursor preceding the desired register number.
2. Press the NEW REG key. The Register Number LED will go OFF and the Register Data LED will now lite. The display will show the value 0.
3. Press the CLR key, the 0 will be replaced by a cursor, and press the 4, 8, 8 & 7 keys in order. The display will reflect the entry of each of these keys in the order entered with a cursor in the most significant position.
4. After all of the digits have been entered, press the NEW DATA key to enter the data. The cursor will disappear indicating the data has been changed.
5. To select an new register to display, press the NEW REG key.

6. ENHANCED MODE OPERATION

When operated in the Open Mode, the DataMate 8330 (WX) affects only the current register accessed and only if a new data entry is made. The enhanced mode offers the functions available in open mode plus additional functions including Combination Lock, Soft Lock, User Defined Read/Write/Data Limits, PLC initiated Error Displays, Selected Register Display and Display Segment Control (DSC).

The enhanced mode is enabled by setting dip switches B6 - C8 to a legal or valid address. This automatically enables the Command Register Block locations (refer to Reserved Register Block section 79). During enhanced mode operation, data will be exchanged between the DataMate and PLC through the command register and reserved register block. Much of this exchange is controlled by ladder logic programs within the PLC written to take advantage of specific DataMate functions. Description and application hints on the various enhanced mode functions can be found in sections specifically covering each function.

7. RESERVED REGISTER BLOCK

When operated in the Enhanced mode a block of registers must be reserved for an exchange of data between the DataMate and the PLC. The number of reserved registers used is dependent on the Enhance Mode functions selected. The minimum number of registers reserved is two and are labeled "Command Register" and "Number Of Last Register Entered".

The Reserved Register Block (RRB) is formed when a valid register number is set on Dip Switches B6 through C8. The address of the first register (command Register) in the RRB is selected as a four digit value.

<u>Dip Switch</u>	<u>Value</u>	<u>Dip Switch</u>	<u>Value</u>
B6	BINARY 1024	C4	BINARY 16
B7	BINARY 512	C5	BINARY 8
B8	BINARY 256	C6	BINARY 4
C1	BINARY 128	C7	BINARY 2
C2	BINARY 64	C8	BINARY 1
C3	BINARY 32		

When the Reserved Register block is formed, register numbers are allotted for all functions. If a particular function is not being used, i.e. Display Segment Control, those register numbers assigned to that function may be used by the PLC for other purposes.

A work sheet is provided as part of this manual. Using it along with the check list will step you through the implementation of these functions.

8. LAST REGISTER ENTERED

If the DataMate is operated in the Enhanced Mode, the second location in the Reserved Register Block is automatically enabled. When a Register Address is accepted by the DataMate, that register number is put into the second Reserved Register Block location (X+1). This feature allows the PLC to know what register the DataMate is currently viewing. This allows a method of synchronizing interaction between the DataMate, PLC and other peripheral devices.

NOTE: These features are not enabled when the DataMate is operated in the Open Mode.

9. READ/WRITE ACCESS LIMITS

On initial power up the DataMate will determine the highest register used in the PLC. The highest register used will then be used as the default setting for the high read/write limit. The 8330 (WX) next checks for enhanced mode by checking if a Reserved Register Block has been set. If selected, dip switch A1, A2, and A3 will be checked. If any of these DIP switches are set the 8330 (WX) will read the appropriate limit value from the Reserved Register Block Table and store it at the associated limit location in the 8330 (WX). See section 10 for Write Data Limits.

If a register number selected by the operator is above or below the set limit, the 8330 (WX) will display -HI- or -LO- respective to the limits set. Pressing the "CLR" key will clear the error and allow the operator to enter a new register number.

When register data is being changed, limit errors can be caused in two ways. First if the data value is above or below the set limits, the 8330 (WX) will display -HI- or -LO- respectively. If the "CLR" key is pressed the unit will clear the display, go to the REGISTER DATA ready mode and a new value may be entered. Second if the current register accessed is not within the write limits the 8330 (WX) will display -HI- or -LO- respective to the limits set, turn OFF the "REGISTER DATA" LED and turn ON the "REGISTER NUMBER" LED. Pressing the "CLR" key will clear the message and set the unit to the REGISTER NUMBER ready mode.

Westinghouse will not allow an operator to access a register higher than the highest register used within the PLC. If during the setup of the enhanced mode, a read or write limit has been set which is higher than the allowed, the 8330 (WX) will respond with the error code -E6- (Illegal Limit Address) when it reads the limits upon power up or by setting bit 1 of the command register.

If the operator enters a register number through the keyboard that is higher than the highest register used, in either the OPEN or ENHANCED mode, the 8330 (WX) will display -HI- and set the "REGISTER NUMBER" LED to ON. Pressing the "CLR" key will clear the message and set the unit to the REGISTER NUMBER ready mode.

When the DataMate Enhanced Mode is selected, the system designer may reassign the High/Low access limits providing they remain within the highest register used. In addition, Read Access may be authorized while restricting Write Access.

Six registers are available in the Reserved Register Block for reassigning limit values (X+2 - X+7). The Write Data Limits (X+6 & 7) are discussed in the next section. A few ground rules and options must be considered when limits are reassigned.

1. Write limits must fall within the boundaries of the read limits to be functional. A register can not be changed if it can not be first read.
2. A valid Command Register must be set on dip switches B6 through C8.
3. Dip switch A1 and/or A2 must be on to enable the desired limit to be acquired from the Reserved Register block. If write limits are to be the same as the Read Limits then dip switch A1 may be left off and only Read Limits need be set ON.

Any of the limits may be changed at any time. For example, you may wish to change the Read/Write limits based on the work shift. By using the data move functions of the PLC, you can move new limits into the assigned RRB registers and set Bit 1 of the Command Register (register X of the RBB) to reread the RRB.

Note: If you are using this function, the bit set function must not be forced ON continuously or it will slow the 8330 (WX) down. If in this example you do not want a given work shift to be able to write to any registers but read them only, set the Low Write Limit above the High Write Limit. Under this condition, the 8330 (WX) will not allow any register to be written to.

10. WRITE DATA LIMITS

Two register are available in the Reserved Register Block to store the High and Low Write Data Limit (X+6 & 7). When A5 is OFF, the default limit is 65535. If A5 is ON the default limit is 9999. If the operator enters a data value into the DataMate that is above the High Write Data Limit, the Register Data Led will light and the display will show "-HI-". Pressing the "CLR" key will allow the operator to key in a new value. If the operator enters a data value into the DataMate that is below the Low Write Data Limit, the Register Data Led will light and the display will show "-LO-". Pressing the "CLR" key will allow the operator to key in a new value.

To set User Write Data Limits, the following three items must be considered:

1. Dip switches B6 - C8 must be set to a legal or valid address.
2. Dip switch A3 must be set on enabling the desired limit to be acquired from the Reserved Register Block.

3. Valid values (0 - 65535) must be stored in the RRB (X+6 & 7).

Four or Five digit Entry/Display is allowed by the DataMate. The number of digits authorized is controlled by the switch A5.

Dip A5 ON = four (4) digit entry & display
Dip A5 OFF = five (5) digit entry & display

When dip switch A5 is OFF, 5 digit data is accepted and displayed by the DataMate. The maximum value that can be entered will be 65535. However, this may be restricted by the High Write Data Limit. The maximum value that can be displayed is 65535 decimal.

When dip switch A5 is ON, 4 digit data is accepted and displayed by the DataMate. The maximum value that can be entered will be 9999. However, this may be restricted by the High Write Data Limit. The maximum value that can be displayed is 9999 decimal.

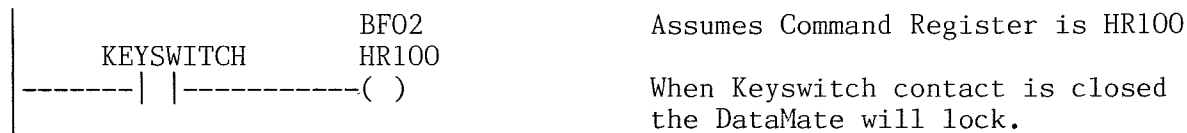
The ability to change the data limits for each register that the operator selects is an often used application. This may be accomplished with logic by watching the Last Register Entered (X+1), when it equals the register that will have new limits, you move the new data limits into the High and Low Data Limit registers (X+6 & 7) and then call for an update by rereading the RRB (Bit 1 of the Cmd. Register X).

11. SECURITY LOCKS

Two methods of locking the 8330 (WX) are available: Soft Lock or Combination Lock. Either or both methods may be used as the application requires. Security locks are part of the enhanced mode functions and so require dip switches B6 - C8 set to a valid register number.

SOFT LOCK:

When bit 2 in the Command Register is set the DataMate keypad will become inactive immediately. The DataMate will remain in its current mode unless changed by the processor. When bit 2 is reset, the keypad will become active and normal operations will resume. This lock is called SOFT LOCK because it is controlled by program software, however, when applications require a key switch, a simple solution is to bring the key switch into the PLC via an input module and use the contact from that input to control bit 2 in the Command Register. The following circuit is recommended:



COMBINATION LOCK:

During Power-Up, the DataMate will test for Cloc. Enabling the combination lock additionally requires setting dip switch A4 ON and storing a combination value in the Reserved Register Block. If the Cloc mode is correctly enabled,

the DataMate will display "CLOC", set the "KEYBOARD LOCKED LED" ON, set bit 7 in the Command Register then wait for a combination entry. The combination must be entered including leading zeros until all five digits are entered. The digits are not displayed as they are entered. After five digits have been entered the operator must press the LOCK key. If the combination is incorrect, the DataMate will set bit 9 in the Command Register and begin flashing CLOC on the display. Pressing the CLR key will stop the flashing, clear Bit 9 and allow a new value to be entered. The combination may be changed at any time by moving a new value into the Reserved Register Block then setting bit 1 in the Command Register. This is useful in applications that may require a new combination for each work shift. It is also possible to SOFT LOCK the DataMate after a particular number of incorrect combination entries by using a counter incremented by bit 9 of the Command Register and setting bit 2 in the Command Register when the preset is reached.

12. DECIMAL POINTS

In many cases it is advantageous to display a value to the operator with a decimal point. This is accomplished by setting one or more bits in the Command Register to achieve the desired display.

<u>Command Register</u> <u>Bit Number</u>	<u>FUNCTION</u>
11	Decimal Point Between Digit 1 & 2
12	Decimal Point Between Digit 2 & 3
13	Decimal Point Between Digit 3 & 4
14	Decimal Point Between Digit 4 & 5

The ability to set decimal points for each register that the operator selects is useful. This may be accomplished with logic by watching the Last Register Entered (X+1), when it equals the register that will display the data with a decimal point, you set the bit that corresponds to the desired location for the decimal point. The bit must be cleared when a new register is viewed or the decimal point will appear in every data register displayed.

13. SELECTED REGISTER DISPLAY

This function allows the system designer to force the 8330 (WX) to display the data contained in a given register.

The desired register address is placed into the Last Register Entered location of the RBB (X+1) and Bit 8 of the Command Register (X) is set high. The 8330 (WX) will then show the new Register Number for a few seconds, then display the data associated with that location. As long as Bit 8 is held ON, the operator can not select another request.

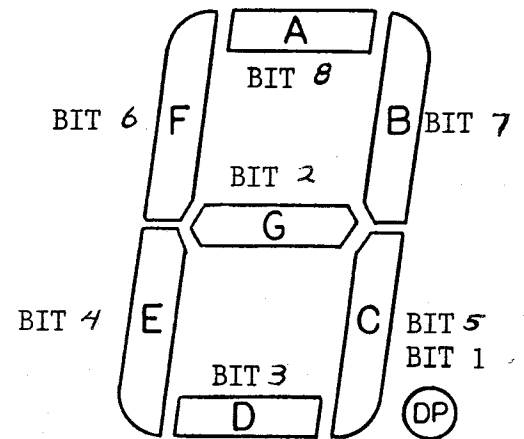
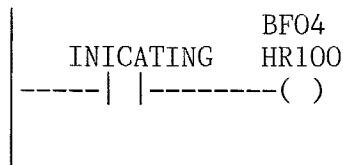
This function is very useful when used with the DataMate 8730 Message Display. It provides a convenient way to prompt the operator to enter data into the PLC without forcing the operator to call up the desired register number.

The DataMate can be forced to display only those holding registers located between the high and low read limits. If no read limits are specified, then all reference numbers below the highest holding register used are legal. If an illegal reference number, or reference number that falls outside of the read limits, is specified, then error code -EB- will be displayed.

14. DISPLAY SEGMENT CONTROL

One of the enhanced mode functions allows the PLC the ability to directly control each segment of the display. Five registers in the Reserved Register Block are assigned to Display Segment Control (refer to Reserved Register Block section). When bit 4 in the Command Register is set, the DataMate will continuously transfer the contents of the five assigned registers directly to the display. The DataMate will also lock preventing key entry during this time. Eight bits in each register correspond to the eight display segments. A separate register is associated with each digit. The diagram below indicates the register bit, digit segment relationship. Setting a bit on will cause the segment to light. By using table-to-register functions in the PLC program it is possible to scroll data across the the DataMate display. When bit 4 in the Command Register is reset the DataMate will return to its exact condition before receiving the display segment control command.

The following example assumes Command Register is HR100:



DISPLAY SEGMENT CONTROL WORK SHEET

REGISTER ADDRESS	BIT NUMBER								DECIMAL VALUE	DIGIT POS.	CHAR.
	08	07	06	05	04	03	02	01			
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

NOTE: Bits 09 through 16 are ignored by the DataMate.
 Display digits are numbered 1 to 5, right to left.

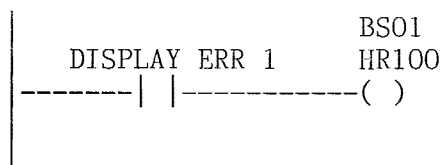
Example: Display the word HELLO. Assume the Command Register is at HR100.

REGISTER ADDRESS	BIT NUMBER								DECIMAL VALUE	DIGIT POS.	CHAR.
	08	07	06	05	04	03	02	01			
HR113	0	1	1	1	1	0	1	0	122	5	H
HR112	1	0	1	0	1	1	1	0	174	4	E
HR111	0	0	1	0	1	1	0	0	44	3	L
HR110	0	0	1	0	1	1	0	0	44	2	L
HR109	1	1	1	1	1	1	0	0	253	1	O

15. PLC INITIATED ERROR DISPLAY

When the 8330 (WX) is operated in the enhanced mode, three bits in the Command Register allow the processor the ability to force three error numbers on the display. The error display takes the form ERR1, ERR2, or ERR3 dependant on the Command Register bit set. The error display will remain on the DataMate until the CLR key is pushed. After the CLR key is pressed, the DataMate will reset the respective error bit in the Command Register then go to the register number ready mode. If more then one error bit is set simultaneously, the DataMate will display first the error with the highest bit number.

In the following example the Command Register is at HR100.



16. OFFSET ADDRESSING

Up to this point all register numbers have been referred to as Absolute Addresses. For example; if you enter 40 and press NEW REG, the DataMate will read the contents of register number HR40.

A second method of accessing registers is available in the DataMate and is referred to as OFFSET ADDRESSING and is enabled by setting dip switch B1 ON.

Dip switch B1 - ON - Offset Addressing
 OFF - Absolute Addressing

In offset addressing register numbers are decimal numbers beginning with the number one (1). Register one is always equal to the Low Read Limit currently stored in the DataMate.

Example: If the Low Read Limit stored in the DataMate is register number 40, then entering 1 and pressing the NEW REG key will display the contents of register number HR40. The pattern is as follows:

Decimal Reg No.	Absolute Register Address
1	HR40 (Low Read Limit)
2	HR41
3	HR42
4	HR43
5	HR44
:	:

17. DIP SWITCH ASSIGNMENTS

<u>SWITCH</u>	<u>SETTING</u>	<u>FUNCTION</u>
A1	ON OFF	WRITE LIMITS ENABLED (Section 9) WRITE LIMITS DISABLED
A2	ON OFF	READ LIMITS ENABLED (Section 9) READ LIMITS DISABLED
A3	ON OFF	WRITE DATA LIMITS ENABLED (Section 10) WRITE DATA LIMITS DISABLED
A4	ON OFF	COMBINATION LOCK ENABLED (Section 11) COMBINATION LOCK DISABLED
A5	ON OFF	4 DIGIT DATA ENTRY/DISPLAY (Section 10) 5 DIGIT DATA ENTRY/DISPLAY
A6	ON OFF	AUTO INCREMENT REGISTER NUMBER (Section 3) REDUCED KEYSTROKE MODE
A7	ON OFF	DAP 1 ENABLED (Section 19) DAP 1 DISABLED
A8	ON OFF	DAP 2 ENABLED (Section 19) DAP 2 DISABLED
B1	ON OFF	OFFSET ADDRESSING (Section 16) ABSOLUTE ADDRESSING
B2	ON OFF	DENIES ACCESS WHEN PLC IS IN PROGRAM MODE PERMITS ACCESS WHEN PLC IS IN PROGRAM MODE
B3	SPARE	
B4	SPARE	
B5	SPARE	

RESERVED REGISTER BLOCK

B6	BINARY	1024
B7	BINARY	512
B8	BINARY	256
C1	BINARY	128
C2	BINARY	64
C3	BINARY	32
C4	BINARY	16
C5	BINARY	8
C6	BINARY	4
C7	BINARY	2
C8	BINARY	1

18. OPERATING FAULT INDICATORS

On initial Power Up and during normal operation diagnostics are executed at key points. If an error occurs, the DataMate will display an error code indicating the type of failure or error. These include hardware failures, communication errors, Reserved Register Block set up errors and operator entry errors.

CODE DESCRIPTION AND CAUSE

-E1-	Ram Memory Error.	Power down then up. If error continues
-E2-	ROM Checksum Error.	replace DataMate.
-E3-	Cmd. Register To High.	RRB is too close to end of highest register used.
-E4-	DataMate UART failure.	Contact Quartech.
-E5-	No PLC Response.	PLC does not respond to DataMate request. May be hardware failure in PLC or DataMate. Incorrect cable or broken wire.
-E6-	Illegal Limit Response.	Limit address beyond highest register used.
-E7-	Illegal Response Received.	PLC responds to DataMate request with NAK byte. Recycle power on DataMate & PLC.
-E8-	Data Mismatch.	
-E9-	Cable Disconnect.	Cable is not connected at DataMate end or incorrect cable is connected.
-EA-	Cable Disconnect.	Cable is not connected at PLC end or PLC has lost power.
-Eb-	Selected Register Display is invalid.	Check value, 0 or beyond Highest Register used.
-HI-	Entry Above Limit.	Data value or Register Number is above the allowed limit.
-LO-	Entry Below Limit.	Data value or Register Number is below the allowed limit.
-dAP-	DAP Address Error	Address is outside allowed area.

Error codes will remain on the display until the CLR key is pressed. If the code is -E1- through -E9- or -dAP-, pressing the CLR key will cause the DataMate to restart as though power were just applied. If -HI- or -LO- are displayed pressing the CLR key will clear the display except for a cursor allowing for a new entry.

19. DISCRETE ANNUNCIATOR

The DataMate 8330 WX can support two 8350 Discrete Annunicator Panels (DAP). The 8350 DAP can display sixteen (16) discrete points which reside in any Holding Register below the highest register used. Two dip switches enable the DAP ports:

- A7 = DAP 1
- A8 = DAP 2

When a DAP port is selected by setting the dip switch on the DataMate, the DataMate looks at the Reserved Register Block (RRB) to find which address is to be displayed. The address stored in the RRB is the address of the register desired.

If the number found in the RRB is a non assessable location, the DataMate will display "-dAP-". The error condition must be corrected before normal operation can occur.

Because the Westinghouse PLC instruction set includes a register to register transfer, to view any register other than a HR type, a Register to Register Move function is used. In addition by using the Bit Follow (BF) function, various types of points may be displayed at the same time.

20. COMMUNICATION CABLE

Cable Type: Multi-Conductor shielded, 20 - 24 AWG
Example: Beldon No. 9538, Alpha No. 1218

ALL PC'S EXCEPT 900

DATAMATE 8330 (WX) END

<u>SIGNAL</u>	<u>PIN</u>		<u>PIN</u>	<u>SIGNAL</u>
PG	1	<---SHIELD		
TXD	2	<----->	3	RXD
RXD	3	<----->	2	TXD
CTS	5	<----->	25	+V
REF	7	<----->	7	REF
DSR	6	<----->	20	DTR
DTR	20	<----->	5	CTS
		+--->	8	DCD
		+--->	24	+V

NOTE: FOR PC900 ONLY, CUT LINES TO PINS 5 & 20 THEN JUMPER PIN 5 TO 20 ON THE DATAMATE END.

Female 25 Pin D-Type with slide latch lock hardware and a right angle hood.

Female 25 Pin D-Type with screw hardware and a straight hood.

Cable is available from QUARTECH - order number:
8565-10 10 foot long for PC-1100/700.

21. ELECTRICAL REQUIREMENTS

Power to the DataMate 8330 (WX) is provided by an external power supply meeting the following requirements:

Output Voltage: 5.0 VDC \pm 5% at 30 MV Ripple
Output Current: 1.0 AMP

We recommend the QUARTECH 8550 Power Supply.

* CHECK THE VOLTAGE AT THE TERMINALS LOCATED ON THE DATAMATE AND *
* ADJUST VOLTAGE WITH DATAMATE TO 5.1 - 5.2 VDC WHILE UNIT IS ON. *

22. INSTALLATION NOTES

GENERAL:

Inspect the unit prior to installation for visible damage that may have occurred during shipment.

NOTICE

ANY CLAIM FOR DAMAGE SHOULD BE FILED WITH THE CARRIER OR HIS AGENT. ALSO NOTIFY YOUR DISTRIBUTORS SO THAT CORRECTIVE ACTION CAN BE TAKEN.

MOUNTING:

The DataMate is designed to be mounted in the door or on an operators console for ease of use. The attached template may be used to assist in the drilling and cutting of the mounting holes for the unit.

Care should be taken to protect the unit from metal chips and conductive particles. Failure to protect the unit may cause failure when power is applied and may void the warranty.

A minimum clearance of six inches should be kept between the unit and any other device that generates heat. In the event that the internal enclosure temperatures periodically exceeds 60 Deg. C (140 Deg. F), fans or a purge air system should be used to increase the air flow and eliminate "Hot Spots" that occur within the panel. Under extreme conditions, air conditioning of the panel maybe required.

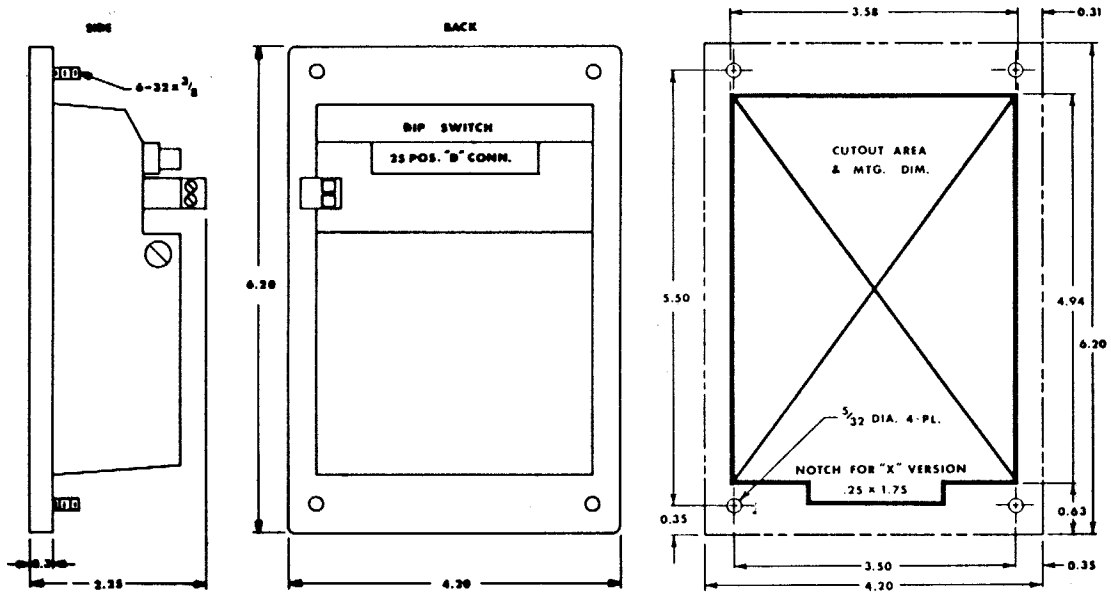
ELECTRICAL:

The DataMate is designed and constructed to minimize the effects of harsh industrial environments. However, when any control system operates under extreme conditions, additional measures must be taken. Additional steps may be required to suppress major sources of interference, should interference become a problem. Obvious sources are inductive items such as relays, motor starters, solenoids and "hard contacts". If suppression is used, suppressors should be placed as close to the item as possible for maximum effectiveness.

CAUTION

THE POWER TO THE DataMate MUST BE TURNED OFF WHILE CHANGING ANY OF THE DIP SWITCHES OR WORKING ON ANY ELECTRICAL TERMINATION; TO PROTECT THE OPERATOR, EQUIPMENT AND THE UNIT FROM POSSIBLE HARM.

23. MECHANICAL DIMENSIONS



All dimensions in inches.

24. CHECK LIST FOR IMPLEMENTING ENHANCED FEATURES

1. Determine which functions you desire to implement.
2. Using the RRB Work Sheet (page 23) determine the starting register number for the RRB and enter that register address for X on your work sheet. Complete the remaining Register Addresses for the Work Sheet.
3. Fill in the Values associated with each of the functions used.
Note: Refer to section 7 for the COMMAND REGISTER.
5. Using either the DataMate or the program loader enter the Values into the RRB per your Work Sheet.

Note: It is good practice to look at all the prospective RRB addresses with either the DataMate or the loader to make sure that those locations are indeed empty. If any contain data, check to see where that data originates from.

6. Turn off power to the DataMate by either unplugging the power terminal or the DataMate or disconnecting the power to the power supply.
7. With Dip switches B6 - C8, set the starting register address for the RRB from your Work Sheet. See section 7 for details.
8. Next set all dip switches ON for the functions you desire see section 17.

Note: You should also determine if you want OFFSET ADDRESSING B4 (section 16) and AUTO INCREMENT REGISTER NUMBER A6 (section 3).

9. Apply power to the DataMate.
10. Check functions and limits as programmed.

Reserved Register Block Worksheet for the 8330WX

Location	Address	Value	Description
X + 0		No Entry	Command Register
X + 1		No Entry	Last Register Entered
X + 2			High Write Limit
X + 3			Low Write Limit
X + 4			High Read Limit
X + 5			Low Read Limit
X + 6			High Data Limit
X + 7			Low Data Limit
X + 8			Combination Lock Value
X + 9			Display Segment Control, Pos. 5
X + 10			Display Segment Control, Pos. 4
X + 11			Display Segment Control, Pos. 3
X + 12			Display Segment Control, Pos. 2
X + 13			Display Segment Control, Pos. 1
X + 14			DAP 1 Address
X + 15			DAP 2 Address

X is the value set on DIP switches B6 through C8.