

- Compact 1/8 DIN size case
- ASCII messages from PLC data memory
- Access PLC registers, timers and counters
- Embed register values and bit sensitive text
- Display data in a BAR GRAPH format
- No setup software required
- Data Entry possible

Function Keys and LEDs

The *DMC-162* has 6 keys, which hold a bit ON in the register WR11 while the key is pressed. These keys can be used to replace push buttons.

The same keys can also be used to monitor and edit PLC data registers, timers, counters etc. when the unit is in the register display mode.

The *DMC-162* has 2 LEDs controlled by 2 bits in WR10 in the PLC. These bits are R500 and R501. The LEDs are ON when the status of these bits is "1" and OFF when the status is "0".

Modes of Operation

Two words are defined in the PLC to control the display and unit operation: CONTROL WORD and OFFSET WORD. In the Aromat FP0 PLC, these words are WR10 and DT0020 respectively.

The unit operates in 2 modes. WR10 controls the operating mode.

In the message mode, 16 words (MESG to MESG+15) are scanned by the *DMC-162* and displayed on the LCD where MESG is the register number stored in DT0000. Each word has 2 bytes of ASCII characters. The user simply has to put the correct data in these registers to display a message. Data can be embedded in a message by special formats. This mode is used to display alarm or status.

In the Operator mode, a key press initiates the register mode and times out after the specified time period to the message mode. This is useful when normally the machine status is monitored but the operator may change presets etc. once in a while. Note that in this mode, the operator gets access to ALL the PLC registers and bits. Hence, it is advisable to use a password protection created using the PLC data registers and ladder logic before this mode is activated.

If the PLC needs to control the register being viewed and/or edited, the message mode itself can be used effectively using the data embedding feature. When the data is to be edited, the UP and DOWN arrow keys can be used in the PLC to increment or decrement the data. This way, the operator gets access only to those registers as allowed by the PLC ladder logic. Refer to the examples for detailed information on this.

The *DMC-162* from Renu Electronics is a low cost addition to the Operator Interface line. Featuring 2 lines of 16 characters backlit LCD, it allows monitoring machine status as messages and change data in the PLC. Cost is saved since the unit uses PLC memory.

Control Word

The *DMC-162* reads WR10 (CONTROL WORD) in the PLC which controls the operating mode. WR11 has the status of the keypad. The status of each bit mentioned is "1" when key is pressed and "0" when the key is released. The meaning of the individual bits in WR10 is as follows:

R500	1: LED0 On 0: LED0 Off	R510	Key F1
R501	1: LED1 On 0: LED1 Off	R511	Key F2
R502-7	Reserved for future use	R512	Key F3
R508-9	00: Message 01: Register	R513	Key F4
	10: Operator 11: Invalid	R514	Key F5
R50A-B	Timeout to message mode	R515	Key F6
	00: 10 sec 01: 20 sec		
	10: 30 sec 11: 40 sec		
R50C-E	Reserved for future use		
R50F	Disable data entry in Message mode (ON: Disable)		

Messages

In the Message mode, the unit displays 32 bytes (16 words) from the location given by the Offset register. For example, if the Offset register has number 6 in it, unit will display 32 bytes (16 words) from DT120 to DT135.

Thus, there are two ways to control the display messages. One is to store messages in the data memory and the ladder logic simply changes the number in the Offset register. Another is, the program memory puts different message data in the MESG registers by using the ASC (Fun 95) instruction. Note that the former method uses data memory while the later uses program memory. Combination of the two can also be used.

Embedded Registers and Variables

It is possible to embed DT0000 to DT0015 in messages by using a special format in the message mode. When the message words (MESG to MESG+15) contain the ASCII bytes which are between 20H to 7FH, the corresponding ASCII characters are displayed. The range 00H to 0BH is used to embed variables in the messages. The range 0CH to 0FH is used to show data in bar graph format. It is possible to embed one data entry field in a message. It is similar to embedding a register, only instead of 0 to F, use 10 to 1F hex bytes to address DT0000 to DT0015. The registers DT0000 to DT0015 can be edited with this feature one at a time in a message. A decimal point can be inserted in the variable. Refer to the example to understand how this can be done. The PLC ladder can control bit sensitive text messages by simply manipulating the ASCII characters based on a bit status.

Specifications

Power	: From Aromat PLC programming port; 1.5 W max
Display	: 2 lines of 16 characters backlit LCD
Bezel	: IP65 rated membrane keypad
Temperature	: Operating: 0 to 50 degrees C Storage: -25 to 80 degrees C
Humidity	: 10% to 90% (Non condensing)
Size	: Bezel: 103 mm X 55 mm; Depth: 32 mm
Panel cutout	: 92 mm X 45 mm (1/8 DIN size cutout)

Communication	: Using the programming port of the Aromat PLC
Immunity to ESD	: Level 3 as per IEC1000-4-2
Immunity to Transients	: Level 3 as per IEC1000-4-4
Immunity to Radiated RF	: Level 3 as per IEC1000-4-3
Immunity to Conducted RF	: Level 3 as per IEC1000-4-6
Emissions	: EN55011 CISPR A

Example

To display a message such as do the following:

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Oven Status: OK
Bake Time: 24.6s
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Assume the data for Bake time is in register EV17. The DMC-162 uses the range DT0000 to DT0015 for embedding. So, move data of EV17 into one of the embedded register ranges, say DT0006. Move number say 124 (decimal) in the Offset register. Now, move the string "Oven Status: OK " into DT124 and subsequent registers using the ASC (Fun 95) instruction. This will fill up registers DT124 to DT131 as shown in the table below. Then move string "Bake Time: " in register DT132 onwards. Now move Hex 06062E06(or Hex 13132E13 in case of data entry field) into word DT137 and DT138. This will display the desired message. Refer to the table below:

Word	ASCII	HEX	Word	ASCII	HEX
DT124	"vO"	764FH	DT132	"aB"	6142H
DT125	"ne"	6E65H	DT133	"ek"	6B65H
DT126	"S "	5320H	DT134	"T "	5420H
DT127	"at"	6174H	DT135	"mi"	6D69H
DT128	"ut"	7574H	DT136	":e"	3A65H
DT129	"s:"	3A73H	DT137		0320H
DT130	"O "	4F20H	DT138	". "	2E03H
DT131	"K"	204BH	DT139	"s "	7303H

In the same example, if the Bake Time is expected to be changed then embed DT0006 as data entry field and use UP and DOWN keys to change the Bake Time. When the ENT key is pressed, the data entered is accepted in the PLC register. The CLR key can be used to clear the data field. Since all the keys are sent to the PLC in the pre-defined bit locations, the PLC will know when a key is pressed and will take the necessary action.

In the Register mode, the following screen will be displayed. Here, by pressing the REG key, the register types will be accessed in the following order: D, T, C, WY, WX, WR, Y, X, R. The UP and DOWN arrow keys allow changing register or device numbers. To edit the data, press the DATA key. The data field will blink to indicate that the unit is ready to accept new data. The new data can be entered by pressing the UP or DOWN arrow keys followed by the ENT key. This mode is very useful for supervisors who need to access all registers/devices in the PLC.

Remember to password protect the mode in the PLC ladder!

PLC REGISTERS USED IN AROMAT PLC

Offset Word	DT0020
Control Word	WR10
Embedded Words	DT0000 – DT0015

WRITING TO DATA WORDS

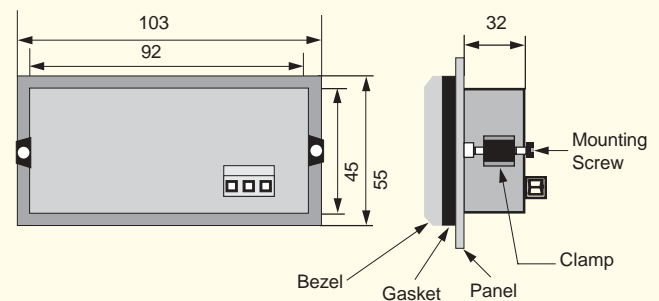
In the Aromat PLC, use the ASC (Fun 95) instruction to write an ASCII text message to the PLC data memory.

Upto 12 characters (6 words) can be written to the data words in one instruction.

The "Data Monitor" screen can also be used to enter data in the data words. However note that the low byte of the word is displayed first, so the data must be entered backwards in every word.

Dimensions

Dimensions in mm.



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