



## Modicon Telemecanique Quantum 140 DVO 853 00 10–30 Volt Verified Output Module

Part No. 31000517 Revision 01

### Introduction

The Quantum 140 DVO 853 00 is a 10 ... 30 Vdc, 32 point output module with diagnostic capability. The module will detect and report the output state sensed at the field connector and, depending on the selected configuration, will verify that the output point is in the state commanded by the PLC. The module is configured in four groups of eight outputs.

### Module Specification Table

Key specifications for the Quantum 140 DVO 853 00 module are as follows:

Number of Output Points	32 in four 8 point groups
LEDs	Active-(Green) indicates valid data transfers are occurring F-(Red) indicates incorrect output state on a channel, loss of field power, or blown group fuse 1 ... 32-(Green) – Indicates output point status
<b>Voltage</b>	
Operating	10.0 ... 30 Vdc
Absolute Maximum	50 Vdc for 1.0 ms decaying voltage pulse
On State Drop/Point	0.4 Vdc @ 0.5 A
<b>Maximum Load Current</b>	
Each Point	0.5 A
Each Group	4 A
Per Module	16 A
Off State Leakage/Point	0.4 mA @ 30 Vdc
<b>Surge current Maximum</b>	
Each Point	2.5 A @ 1 ms duration (no more than 6 per minute)

**Module  
Specification  
Table, continued**

<b>Response (Resistive Loads)</b>	
OFF - ON	1 ms (typical), 2 ms (max)
ON - OFF	1 ms (typical), 2 ms (max)
<b>Isolation</b>	
Group to Bus	1780 Vac RMS for 1 minute
Group to Group	500 Vac for 1 minute
Load Inductance Maximum	0.5 Henry @ 4 Hz switching frequency or $L = \frac{0.5}{I^2 F}$ where L = Load Inductance (Henry) I = Load Current (A) F = Switching Frequency (Hz)
Tungsten Load Maximum	2.5 W @ 10 Vdc 3 W @ 12 Vdc 6 W @ 24 Vdc
Load Capacitance Maximum	75 $\mu$ F
Output Protection (internal)	Transient voltage suppression, overload (short circuit) protection
Fault Detection	Blown fuse detect, loss of power, incorrect output state
Bus Current Required	500 mA
Power Dissipation	[2.5 + (0.1 x No. of points ON) + (total load current x 0.4)] watts
External Power	10 ... 30 Vdc
<b>Fusing</b>	
Internal	5.0 Amp fuse per group, P/N 043502405
External	Not required. If desired, a 3/4 A, 250 V fuse (P/N 57-0078-00) may be used.
<b>Programming Software</b>	
Type and version	Concept, Ver. 2.2 or higher Modsoft, Ver. 2.6.1 or higher

**Fixed Wiring  
System**

The Quantum 140 DVO 853 00 module is designed with a fixed wiring system where the field connections are made to a 40-pin, fixed position, terminal strip which is plugged into the module.

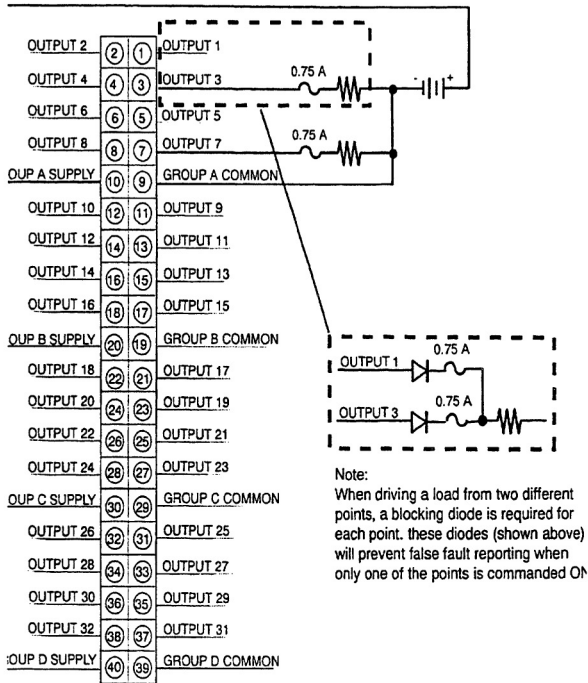
**Terminal Strip Keying Assignment**

The terminal strip connector is keyed to prevent the wrong inputs from being applied to the module. The keying assignment is given below:

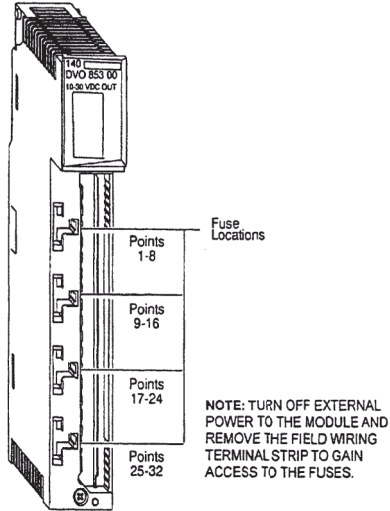
Module Part Number	Module Coding	Terminal Strip Coding
140 DVO 853 00	ABF	CDE

**Wiring Diagram**

A wiring diagram for the Quantum 140 DVO 853 00 module is shown below.



### Fuse Location



**LED Indicators** A layout of the LED indicators is shown below.

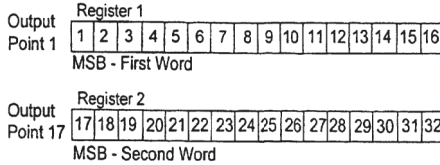
	Active	F	
1	9	17	25
2	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	24	32

A description of the LEDs is given in the module specification table on page 1.

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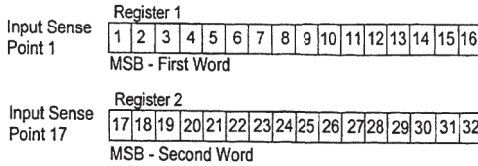
**I/O Map Register Assignments (Outputs)**

The 140 DVO 853 00 module can be configured as either 32 contiguous 0x references or as two 4x registers assigned as follow:



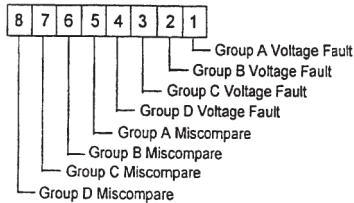
**I/O Map Register Assignments (Inputs)**

The 140 DVO 853 00 module can be configured as either 32 contiguous 1x references or as two 3x registers assigned as follow:



**I/O Map Status Byte**

The eight bits in the I/O map status byte are used as follows:



The Voltage Fault bit is set when the field supply is not present, or the Group Fuse is blown.

The Mismatch bit is set when any point within the group does not match its commanded state.

**Modsoft Zoom  
Screen  
Selections**

The module zoom screen selections are shown below.

Head-slot: X Drop: X Slot: X

Output Shutdown State: Fail States  
Disabled

	Fail States	User Defined Values	Status/Input
Group Number GROUP X	<div style="border: 1px solid black; padding: 2px; text-align: center;">Outputs OFF</div> <p style="text-align: center;">Last Value</p> <p style="text-align: center;">User Defined</p>	00000000	<div style="border: 1px solid black; padding: 2px; text-align: center;">Verified Health</div> <p style="text-align: center;">Verified Fault</p> <p style="text-align: center;">Input Only</p> <p style="text-align: center;">Actual</p>
ALLOW AUTOMATIC RESTART OF FAILED POINTS			<div style="border: 1px solid black; padding: 2px; text-align: center;">NO</div> <p style="text-align: center;">YES</p>

**Zoom Screen  
Selection  
Descriptions**

**Output Shutdown State** - Determines the module output states if backplane communication is lost (i.e., no "ACTIVE" LED on the module).

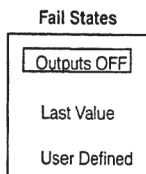
Output Shutdown State: Fail States  
Disabled

**Fail States:** Group outputs are per the selection made in the "Fail States" column.

**Disabled:** Forces all outputs to be in the OFF state

**Zoom Screen  
Selection  
Descriptions  
(con't)**

**Fail States** - Module output state choices if selected in "Output Shutdown State" menu.

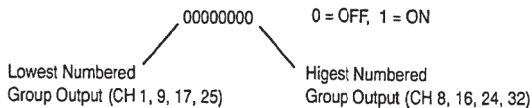


**Outputs OFF:** Group outputs turn OFF

**Last Value:** Group outputs remain in the state they were in.

**User Defined:** Group output states may be individually selected in the "User Defined Values" column to be ON or OFF.

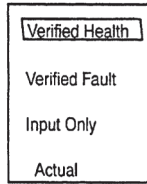
**User Defined Values** - Module output state choices if selected in "Fail States" menu



**Zoom Screen  
Selection  
Descriptions  
(con't)**

**Status /Input - Re: I/O Map Register Assignments (Inputs)**

**Status/Input**



**Verified Health:** The associated bit = 1 when the point output command and module output state agree.

**Verified Fault:** The associated bit = 1 when the point output command and module output state disagree.

**Input Only:** Disables the output switches and reports the output point status, 1 = ON, useful for diagnostic purposes

**Actual:** Module output state, 1 = ON



Note: When "Input Only" is selected, the point LEDs will not report the state of the input

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**Zoom Screen  
Selection  
Descriptions  
(con't)**

**Allow Automatic Restart of Faulted Points**

**ALLOW AUTOMATIC RESTART OF FAULTED POINTS**



**NO:** Module outputs that fault during the ON state are latched off until the user clears the point bit to the OFF (0) state, and then sets it back to the ON (1) state.

State of output points, Status (Input Register) bits, LEDs and Fault Bit (I/O Map Status Byte) for the three states are as follows:

Input Mode	Fault Occurs (Point commanded ON shuts OFF)	Off Command Sent	On Command sent (after fault is removed)
Verified Health	Output point = OFF Status bit = 0 Output LED = OFF Fault LED = OFF Group Fault Flag = 1	Output point = OFF Status bit = 0 Output LED = OFF Fault LED = ON Group Fault Flag = 1	Output point = ON Status bit = 1 Output LED = ON Fault LED = OFF Group Fault Flag = 0
Verified Fault	Output point = OFF Status bit = 1 Output LED = OFF Fault LED = OFF Group Fault Flag = 1	Output point = OFF Status bit = 1 Output LED = OFF Fault LED = ON Group Fault Flag = 1	Output point = ON Status bit = 0 Output LED = ON Fault LED = OFF Group Fault Flag = 0
Actual	Output point = OFF Status bit = 0 Output LED = OFF Fault LED = OFF Group Fault Flag = 1	Output point = OFF Status bit = 0 Output LED = OFF Fault LED = ON Group Fault Flag = 1	Output point = ON Status bit = 1 Output LED = ON Fault LED = OFF Group Fault Flag = 0

**Yes:** Module outputs that fault during the ON state are controlled by a thermal protection mechanism. At shutdown the appropriate fault/status indications will be present.

After shutdown, the output device will cool and try to turn itself back on. If the fault has been removed, the output will function normally and fault/status indications will be removed. If the fault is still present, the point will again shut down and repeat the cycle until the fault is removed or the point is commanded off.

When a faulted point is commanded off, all fault indications will no longer be present because the miscompare will no longer exist.

**Thermally  
Protected Output  
Devices**

When choosing "Yes" (previous page), the use of thermally protected output devices with the 140 DVO 853 00 module can produce safety concerns. Please read the following warning regarding this situation.



**WARNING**

In the event of an enabled output sensing an over current condition, the output will disable, until the over current condition is removed. The output will then re-enable itself, if still set ON in the logic program.

For complete information concerning this and other modules, please obtain a copy of the *Quantum Automation Series Hardware Reference Guide* (840 USE 100 00) from your distributor or local sales office.

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