The Application Note is specific to the Quantum III, the Mentor II has it's own version.

**Quantum III / MD24 Quick Setup for Profibus-DP**

**Scope** - This procedure applies to a Mentor II / MD24 combination for speed or torque control and cyclic mappings set up by the default Mentor II / Quantum III “*.GSD” file. Confirm Drive firmware revision at Ver 4.10 or above at #11.15. Fieldbus start-stop control requires that “Disable Normal Logic Functions” be set to “Disabled” (#8.21=1). This procedure also assumes that the Profibus Master and Profibus-DP Scanner will be configured to match the node that the MD24 is configured for and at a data rate that the MD24 supports after step 4 has been completed.

**Instructions**

**Step 1 – Menu 8 and 9** Insure that the values in any of the following parameter pointer locations do not conflict with the “control word” mappings of the Quantum III. If a value of 111, 112, or 113 is found in any of the following locations, set the value at that location to a value of zero (“0.00”). Values of #8.14, #8.15 or #8.21 can also interfere with the “control word” functioning as expected.

<table>
<thead>
<tr>
<th>MM.PP</th>
<th>If following value is found:</th>
<th>Then set to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>#8.12</td>
<td>111</td>
<td>111 (* for “simple” control)</td>
</tr>
<tr>
<td>#8.13</td>
<td>113</td>
<td>0.00 (un-map)</td>
</tr>
<tr>
<td>#8.14</td>
<td>112</td>
<td>0.00 (un-map)</td>
</tr>
<tr>
<td>#8.15</td>
<td>115</td>
<td>0.00 (un-map)</td>
</tr>
<tr>
<td>#8.16</td>
<td>1034</td>
<td>Okay as is</td>
</tr>
<tr>
<td>#8.17</td>
<td>111, 112, 113, 114, 115, 821</td>
<td>0.00 (un-map)</td>
</tr>
<tr>
<td>#8.18</td>
<td>“ (same)</td>
<td>0.00 (un-map)</td>
</tr>
<tr>
<td>#8.19</td>
<td>“ (same)</td>
<td>0.00 (un-map)</td>
</tr>
<tr>
<td>#8.20</td>
<td>111, 112, 113, 114, 115, 821</td>
<td>0.00 (un-map)</td>
</tr>
<tr>
<td>#9.25</td>
<td>1009</td>
<td>1521 (close armature contactor)</td>
</tr>
</tbody>
</table>

**Step 2 – Menu 11 and 14** Insure that the following network configuration parameters are set to the required values and are “saved” in the Drive BEFORE fitting the MD25 to the Mentor II.

<table>
<thead>
<tr>
<th>MM.PP</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>#14.01</td>
<td>1 to 124</td>
<td>Rates of 1.96, 19.2, 93.75, 500 kbps and 1.5 mbps supported</td>
</tr>
<tr>
<td>#14.02</td>
<td>0</td>
<td>MAC-ID, all nodes different</td>
</tr>
<tr>
<td>#11.02</td>
<td>1941</td>
<td>In Word 1 from #19.41 (Mentor Status Word)</td>
</tr>
<tr>
<td>#11.03</td>
<td>302</td>
<td>In Word 2 from #3.02 (actual speed, hi res)</td>
</tr>
<tr>
<td>#11.04</td>
<td>501</td>
<td>In Word 3 from #5.01 (torque actual, hi res)</td>
</tr>
<tr>
<td>#11.05</td>
<td>1940</td>
<td>Out Word 1 to #19.40 (Mentor Control Word)</td>
</tr>
<tr>
<td>#11.06</td>
<td>118</td>
<td>Out Word 2 to #1.18 (speed reference, hi res)</td>
</tr>
<tr>
<td>#11.07</td>
<td>408</td>
<td>Out Word 3 to #4.08 (torque reference, hi res, check #7.14!)</td>
</tr>
</tbody>
</table>

**Step 3 – Menu 1** Insure that parameter #01.18 “REF 2” is selected as the speed reference source.

1. Check and set parameter #1.14 to a value of “1”.
2. Check and set parameter #1.15 to a value of “0”.

**Step 4 – Save and activate**

1. Save Menu 1 through Menu 16 by setting #x.00 = 001 then press the red “RESET” button on the Drive.

**Step 5 – Observe Normal Indications**

1. (RO) Parameter #11.16 = “0173” for MD-24 fitted and firmware version 1.7.3 detected
Interface Armature Contactor for Fieldbus Control

- Disconnect AC power to the Drive.
- Configure Quantum III for "2-Wire RUN" by setting JP1 on 9500-4025 AC Interface board to the "2-3" position (to the right) and connecting TB1-5 to TB1-6 on the same 9500-4025 board via jumper.

  Hint- 9500-4025 is the bottom board of the 2-board set. JP1 is easier to get at if you unplug the TB1 terminal connection block from that PC board. Also note that JP1 default position is the "1-2" position (to the left).

- Connect TB4-34 on MDA-2B to TB1-6 on 9500-4025 AC Interface via jumper wire
- Connect TB4-36 on MDA-2B to TB1-7 on 9500-4025 AC Interface via jumper wire

- Insure all terminal blocks and jumpers in place, and re-apply AC power to the Drive.
- The Quantum III is now configured for Profibus ON/OFF control and observable on the network.
- If you have not done so already, map three polled words out from and into the node with the scanner configuration tool of choice. See the next sections for extra guidance.
Controlling the Quantum III from the Control Word

Before motion is possible, the "external fault / trip" input must be satisfied, via maintained contact from TB1-1 to TB1-4 on the 9500-4025. This is usually provided by the external Emergency Stop/Reset logic.

To start the Quantum III in speed control, with the ramps enabled, and under control of the speed reference set by OUT WORD 2, set the following bits in the Control Word:

- Bit 01 – Reference on (# 1.11)
- Bit 07 – Ramp enable (# 2.02)
- Bit 08 – Armature contactor (#15.21)
- Bit 15 – VALID bit
- Hexadecimal value: 0x8182
- Decimal value: 33154

To start the Quantum III in torque control and under control of the torque reference set by OUT WORD 3, set the following bits in the Control Word:

- Bit 01 – Reference on (# 1.11)
- Bit 04 – Torque Mode 0 (# 4.12)
- Bit 08 – Armature contactor (#15.21)
- Bit 15 – VALID bit
- Hexadecimal value: 0x 8112
- Decimal value: 33042

Note that the default destination mapping for GP4 is also to #4.08, so be sure #7.14 = 0000.

Speed target and speed feedback scaling issue(s)

Internally, the Quantum III internally handles some parameters at a higher resolution (minimum ±16000 range) than displayed (±1000 range). The MD25 accesses these parameters at the higher resolution. The value displayed on the Quantum III Keypad / Display remains at the normal range. For example, a value of 8000 written to #1.18 via the MD25, will display the value of #1.18 as “0500”.

These higher resolution parameters include, but are not limited, to the following:

- #1.18 (Range ±16000 : ±100%)
- #3.18 (Range ±16000 : ±100%)
- #4.08 (Range ±16000 : ±100%)
- #4.09 (Range ±16000 : ±100%)
- #7.05 (Range ±16000 : ±100%, read only, note that a range of ±16383 is observable)
- #1.03 (Range ±16000 : ±100%, read only)
- #3.01 (Range ±16000 : ±100%, read only)
- #3.02 (Range ±16000 : ±100%, read only)

• For safety related concerns also see CTAN 138 for additional considerations at

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