USD AVI Manual Configuration Document
## Document Revision History

<table>
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<tr>
<th>Date</th>
<th>Revision Number*</th>
<th>Name</th>
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<tr>
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* Example 1.0, 2.0, etc. Use whole numbers for major revisions (new sections, chapters, appendices) and decimal (1.1, 2.3) for minor revisions affecting a few pages or paragraphs.

**Latest changes are highlighted in YELLOW.**
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1 INTRODUCTION

1.1 Document Purpose

The objective of this document is to describe how to manually configure the AVI portion of the Unified Systems Driver. The configuration of the AVI portion of the USD is very in depth, only those who are well versed in both the AVI system and the USD shall attempt manual configuration. This document shall only be used if the “USD Configurator” (USC) is not available for use. Manual configuration is not recommended.

Note: This document does not contain information on how AVI interfaces with other systems, nor does it contain information on the full functionality of any given application. This document only contains information on how to configure an AVI point in accordance with an existing Point Document.

1.2 Intended Users

- Software developers

1.3 Supporting Documentation

Chrysler documents listed below are instrumental in defining AVI Points, and configuration. The user should have a good understanding of these documents.

- ‘AVI Point Document’ - This is the design document that outlines the operation of the AVI point(s). The title of the document may vary depending on the plant and project. This document must be completed before configuration of a point can begin. Contact an ASLM or APIC Systems representative for details about this document.
- ‘USD Configuration Doc’ – This document describes how to install the USD and explains how to add any additional logic that may be required.

1.4 Terms & Conventions

N/A Not Applicable

Operator The term operator is used generically to describe a support person. An operator may be production, maintenance or engineering personnel depending on the specific application.

1.5 Deviations and conflicts

- Deviations from this standard shall require prior written approval of an authorized Chrysler representative. Any deviations granted shall apply only to the project or contract in question and shall not be considered as permanent or precedent.
- This standard shall not replace provisions or requirements contained in federal, state or local laws and regulations. Where an article or articles of this standard appear to conflict with statutory requirements, the apparent conflict shall be brought to the attention of an authorized Chrysler representative for resolution.
- The phrases “prior written approval” and “unless specified otherwise”, and phrases implying an equivalent meaning, shall require the designer to seek approval for
deviation or exemption from this standard from an authorized Chrysler representative.

1.6 Use of “Shall and Should”
The word “shall” is understood as a requirement. The word “should” is understood as a recommendation or preference. The designer or vendor may be required to justify a deviation from the standard, and may be required by an authorized Chrysler representative to make alterations so as to conform.
2 USD AVI Step-by-Step Configuration

This chapter explains how to configure the AVI portion of the USD on a step-by-step basis. Each section within this chapter explains the configuration required for each different piece of the driver. Start with section 2.1 General Configuration (below) and follow the instructions.

2.1 General Configuration

Step #1: Disable the AVI portion of the USD driver by setting N275:120/0=0. The default value is 0, but it should be verified before any configuration is changed.

Step #2: Enter the total number of Points in N275:110. The value in this word shall be manually set to equal the number of active AVI points in the PLC. The default value is 1, 0 – 15 (dec) is valid. If the number entered here is greater than 0 then goto section ‘2.2 Request Block Configuration’, otherwise proceed to Next Step.

Step #3: Enter the total number of Devices in N275:111. The value in this word shall be manually set to equal the number of active Devices (Readers) in the PLC. The default value is 1, 0 – 19 (dec) is valid. If the number entered here is greater than 0 then goto section 2.3 Device Configuration, otherwise proceed to Next Step.

Step #4: Enter the total number of (RB/DB/DeviceNet) Modules in N275:112. The value in this word shall be manually set to equal the combined total number of DB and/or RB and/or DeviceNet Modules in the PLC. The default value is 1, 0 – 10 (dec) is valid. If any combination of DB and/or RB Module is used then goto section 2.4 RB/DB Module Configuration, if no Module is used or if all Devices are using DeviceNet for communication proceed to Next Step.

Step #5: Enter the total number of PanelViews in N275:113. The value in this word shall be manually set to equal the number of PanelViews in the PLC. The default value is 1, 0 – 10 (dec) is valid. If the number entered here is greater than 0 then goto section 2.5 PanelView Configuration in this document, otherwise proceed to Next Step.

Step #6: Enter the total Number of Sensor Blocks in N275:114. The value in this word shall be manually set to equal the number of Sensor Blocks in the PLC. The default value is 3, 0 – 99 (dec) is valid. If the number entered here is greater than 0 then goto section 2.6 Sensor Block Configuration, otherwise proceed to Next Step.

Step #7: Configure the Communication Type. If communication with AVI workcell is required, goto section ‘2.7 AVI Workcell Communication Configuration’. If communication with AVI workcell is not required, manually set N275:121=0 and proceed to Next Step.

Step #8: Configure the Safe Buffer. If safe buffering the data is required goto section ‘2.8 Safe Buffer Configuration’, otherwise proceed to Next Step.

Step #9: Configure AVI FIS Data Blocks. Goto section ‘2.9 AVI FIS Data Block Configuration’.

Step #10: Configure any AVI Special Applications if required. Special Applications include “Schedule Request”, “Marriage”, “Style Setup GN” and “GS-GN Compare”. If any of these is to be configured then goto section ‘2.10 AVI Special Application Configuration’, otherwise proceed to Next Step.

Step #11: Enter the Plant Code by using an ASCII character in the upper byte of N275:130. The Radix shall first be changed to ASCII and the Plant Code Letter shall be entered (in upper case), in this format ‘x\00’ (x= Plant Code). An example would be N275:130= R\00 (ASCII). Each plant has a unique Plant Code, contact an APIC Systems representative if the Plant Code is unknown. Proceed to Next Step.

Step #12: Enable the Output Buffer initialization by setting N275:122/00=1. This will initiate the output buffer once the AVI driver is Enabled. This bit will automatically be reset and a value of ‘–1’ will be copied into each configured output buffer (N277) storage location word when initialization is successfully completed.

Step #13: Enable the AVI Configuration initialization by setting N275:122/15=1. This will initiate the changes to the AVI General Configuration once the AVI driver is Enabled. This bit will automatically be reset and the proper datatable memory size (number of Elements) will be calculated and copied into each of the AVI datatables that require variable sizing (Request Block, Sensor Block, Device Block, etc…) when initialization is successfully completed. This initialization step replaces the manual calculation that used to be required per Block in all AVI driver revisions 03.09 and below.

Step #14: Enable the AVI portion of the USD driver by setting N275:120/00=1. Configuration is now complete.
2.2 Request Block Configuration

This section explains how about configuring the Request Block portion of the AVI driver. The addresses shown starting at ‘Step #2:’ are for the first request block only, add 50 words to each address per additional Request Block for configuring additional points. Example, configuration of the second Request Block would start at N282:60, the third would start at N282:110, etc… Up to 15 points are supported.

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<tr>
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<td>410-459</td>
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<td>560-609</td>
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</tbody>
</table>

Step #1: Size the Request Block (N282) datafile. Modify the memory size (number of Elements) in the Request Block datafile N282. The size (in Element) can be calculated by using this formula: (N275:110*50)+10.

Step #2: Enter the Point ID number in N282:10. The value in this word shall be manually set to equal the point number (each point number should be unique within the plant). This number must be no longer than four decimal digits. Points should be configured in ascending order per PLC starting with the lowest point number (if possible).

Step #3: Configure the Message Safe Buffer Enable(s) in words N282:13 & N282:14. See below for the list of Message types and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

- N282:13/00 – (Type 1) Safe Buffer Vehicle ID
- N282:13/01 – (Type 2) (DO NOT ENABLE)
- N282:13/02 – (Type 3) (DO NOT ENABLE)
- N282:13/03 - (Type 4) Safe Buffer Marriage Request
- N282:13/04 - (Type 5) (DO NOT ENABLE)
- N282:13/05 - (Type 6) (DO NOT ENABLE)
- N282:13/06 - (Type 7) (DO NOT ENABLE)
- N282:13/07 - (Type 8) Safe Buffer Index
- N282:13/08 - (Type 9) Spare
- N282:13/09 - (Type 10) Safe Buffer Vehicle Update
- N282:13/10 - (Type 11) Safe Buffer Marriage Update (Future)
- N282:13/11 - (Type 12) Spare
- N282:13/12 - (Type 13) Spare
- N282:13/13 - (Type 14) Spare
- N282:13/14 - (Type 15) Spare
- N282:13/15 - (Type 16) Spare
- N282:14 - (Types 17-32) Spare

Note: These bits are just Safe Buffer Message Enable’s, these work in conjunction with Message Request Enable’s. If a message type is to be safe buffered, it must also be ‘enabled’ (see next step). Not all message types support Safe Buffering, refer to point document to find out if it is to be used, contact an APIC Systems representative if in doubt.

Step #4: Configure the Message Request Enable in words N282:15 & N282:16. Only ONE Request type shall be enabled per Request Block, if additional Requests are needed then additional Request Blocks will be required. See below for the list of Request types and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

- N282:15/00 – (Type 1) DO NOT ENABLE, use option N282:20/05 instead, see Step #10:
- N282:15/01 – (Type 2) Get Specific Request
- N282:15/02 – (Type 3) Get Next Request
- N282:15/03 - (Type 4) Marriage Request
Step #5: Enter the Manual ID timeout preset in N282:17. The value in this word should be manually set to equal the desired time delay (in milliseconds) between when the corresponding Sensor Block “In Position” signal is ON and when Manual Entry is allowed. The default value for this word is 2000 (dec), this is equal to two (2) seconds.

Step #6: Enter the Request Retry timeout preset in N282:18. The value in this word should be manually set to equal the desired time (in milliseconds) between Request Retries (if retries are enabled). The default value for this word is 3000 (dec), this is equal to three (3) seconds.

Step #7: Enter the AVI timeout preset in N282:19. The value in this word should be manually set to equal the desired time (in milliseconds) between when the corresponding Sensor Block “In Position” signal is ON and the OEM Accept signal is ON. The default value for this word is 15000 (dec), this is equal to fifteen (15) seconds.

Step #8: Configure the required message option(s) in N282:20 & N282:21. See below for the list of options and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

- N282:20/00 – Label Request
- N282:20/01 – No-Read Request
- N282:20/02 – Empty Carrier Request
- N282:20/03 – Marriage Request
- N282:20/04 – Manual Request
- N282:20/05 – Vehicle ID Message
- N282:20/06 – OEM Accept Enable
- N282:20/07 – Configurable Vehicle ID Type Enable (see Step #12:)
- N282:20/08 – Style Setup Point Enable (see Step #9:)
- N282:20/09 – Spare
- N282:20/10 – Spare
- N282:20/11 – GS-GN Compare Get Specific Enable (see Step #9:)
- N282:20/12 – GS-GN Compare Get Next Enable (see Step #9:)
- N282:20/13 – Spare
- N282:20/14 – Enable Duplicate Tag Read
- N282:20/15 – No Read Vehicle ID Message Enable
- N282:21/00 – Request Message Retry Enable
- N282:21/01 – Don’t stop Retries Enable
- N282:21/02 – Empty Carrier Vehicle ID Message Enable
- N282:21/03 – Schedule Request Enable
- N282:21/04 – Request on Command Enable
- N282:21/05 – Spare
- N282:21/06 – Spare
- N282:21/07 – Spare
- N282:21/08 – Spare
- N282:21/09 – Spare
- N282:21/10 – Spare
- N282:21/11 – Spare
**Step #9:** Enter the Special AVI Interface Block number in **N282:22**. This word only need be configured if N282:20/08, N282:20/11, or N282:20/12 is also set. The value in this word determines what Special AVI Interface Block to associate with the request. 0-5 (dec) is valid. (Marriage is not yet supported)

**Step #10:** Configure operator intervention access/lockout with the desired associated PanelView(s) **N282:23**. See below for the list of options and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

*Note: The impact of the configuration of this word has been completely revised for AVI revision 05.00. It will be necessary to modify this word if upgrading from a prior rev of the AVI driver."

**N282:23/00** – Restrict PanelView Access to Manual Entry or Interface Screen Enable (This control bit supersedes all options listed below.)
N282:23/01 – Manual Entry or Interface Screen Access from PanelView #1 Enable
N282:23/02 – Manual Entry or Interface Screen Access from PanelView #2 Enable
N282:23/03 – Manual Entry or Interface Screen Access from PanelView #3 Enable
N282:23/04 – Manual Entry or Interface Screen Access from PanelView #4 Enable
N282:23/05 – Manual Entry or Interface Screen Access from PanelView #5 Enable
N282:23/06 – Manual Entry or Interface Screen Access from PanelView #6 Enable
N282:23/07 – Manual Entry or Interface Screen Access from PanelView #7 Enable
N282:23/08 – Manual Entry or Interface Screen Access from PanelView #8 Enable
N282:23/09 – Manual Entry or Interface Screen Access from PanelView #9 Enable
N282:23/10 – Manual Entry or Interface Screen Access from PanelView #10 Enable
N282:23/11 – Reserved
N282:23/12 – Reserved
N282:23/13 – Reserved
N282:23/14 – Reserved
N282:23/15 – Reserved

**Step #11:** Enter the Workcell Response Template number in **N282:24**. Refer to the Point Document for this value. The Response Template used will determine what data is sent back from workcell and where each piece of the data resides. This is a decimal value.

**Step #12:** Enter the OEM Request Header (Configurable Vehicle ID) in **N282:35**. This word only need be configured if N282:20/07 is also set. The value in this word determines what data is being sent to workcell in the Request. See below for the list of options and their corresponding enable values.

N282:35 = 00 - None
N282:35 = 01 - Primary Label
N282:35 = 02 - VIN
N282:35 = 03 - Secondary Label
N282:35 = 04 - Tertiary Label
N282:35 = 05 - Frame Sequence
N282:35 = 06 - BC Last Tracked Sequence
N282:35 = 07 - Trim Sequence
N282:35 = 08 - Alternate Sequence
N282:35 = 09 - VON
N282:35 = 10 - Broadcast Status
N282:35 = 11 - VIN Spec
N282:35 = 12 - Gateline Sequence
N282:35 = 13 - Gap
N282:35 = 14 - Carrier ID
N282:35 = 15 - Empty Carrier

**Step #13:** Enter the Main Device Block in **N282:56**. The value in this word should be manually set to equal the Main Device (Reader) block number. This number relates to the N286 datable address that the Main Device is configured in. Each Device block is 50 words long, starting at word N286:10 for the first device, if this
block is the Main device for this point then a 1 would be entered here. If the Main device configuration starts in word N286:60, then a 2 would be entered here, if configuration starts in N286:110 then a 3 would be entered, and so on.

**Step #14:** Enter the First Backup Device Block in **N282:57**. The value in this word should be manually set to equal the Backup #1 Device (Reader) block number. This number relates to the N286 datable address that the Backup #1 Device is configured in. Each Device block is 50 words long, starting at word N286:10 for the first device, if this block is the Backup #1 device for this point then a 1 would be entered here. If the Backup #1 device configuration starts in word N286:60, then a 2 would be entered here, if configuration starts in N286:110 then a 3 would be entered, and so on.

**Step #15:** Enter the Second Backup Device Block in **N282:58**. The value in this word should be manually set to equal the Backup #2 Device (Reader) block number. This number relates to the N286 datable address that the Backup #2 Device is configured in. Each Device block is 50 words long, starting at word N286:10 for the first device, if this block is the Backup #2 device for this point then a 1 would be entered here. If the Backup #2 device configuration starts in word N286:60, then a 2 would be entered here, if configuration starts in N286:110 then a 3 would be entered, and so on.

**Step #16:** Enter the PanelView Interface Screen number (if required) in **N282:59**. The configuration of this word is required when the standard AVI Manual Entry screen is not to be used as the operator interface for AVI data correction, such as on a Style Setup GN, GS-GN Compare, or Marriage point. It may also be used if the OEM requires access to a non-AVI (custom) screen as an AVI interface. The decimal value entered in this word determines the PanelView screen number that is called when the “Interface” PB is pressed on the AVI Point Status and AVI Overview screens. If this word is configured as “0” the standard AVI Manual Entry screen will be used for operator data correction.

**Step #17:** Return to **Step #2:** if N275:110=2 (or greater), offset addresses for additional points according to instructions at the beginning of this section.

**Step #18:** Goto section **2.1 General Configuration, Step #3:**
2.3 Device Configuration

This section explains how to go about configuring the Device (Reader) Block portion of the AVI driver. The addresses shown starting at ‘Step #2:’ are for the first Device Block only, add 50 words to each address per additional Device Block for configuring additional devices. Example, configuration of the second Device Block would start at N286:60, the third would start at N286:110, etc… Up to 19 devices are supported.

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<td>12</td>
<td>560-609</td>
<td>16</td>
<td>760-809</td>
</tr>
</tbody>
</table>

Step #1: Size the Device Block (N286) datafile. Modify the memory size (number of Elements) in the Device Block datafile N286. The size (in Element) can be calculated by using this formula: (N275:111*50)+10.

Step #2: Enter the Device ID number in N286:10. The value in this word should be manually set to equal the reader number. (If this is the Main reader, this value is usually the same as the corresponding point number. A value of 5 is usually added per each additional Backup reader.) This number will be specified in the Point Document. This number must be no longer than four decimal digits. Devices should be configured in ascending order per PLC starting with the lowest device number (if possible).

Step #3: Configure the device type information N286:11. See below for the list of options and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

- N286:11/00 – Main Reader
- N286:11/01 – Backup Reader #1
- N286:11/02 – Backup Reader #2
- N286:11/03 – Spare
- N286:11/04 – DeviceNet communication Enable (See Step #5):
  - N286:11/05 – Spare
  - N286:11/06 – Spare
  - N286:11/07 – Device Type Fixed Reader
  - N286:11/08 – Device Type Handscanner
  - N286:11/09 – Device Type Other
  - N286:11/10 – Spare
  - N286:11/11 – Spare
  - N286:11/12 – Spare
  - N286:11/13 – Spare
  - N286:11/14 – Spare
  - N286:11/15 – Spare
  - N286:21/00 – Spare
  - N286:21/01 – Spare
  - N286:21/02 – Spare

Step #4: Enter the Low Decode Alarm value preset in N286:12. The value in this word should be manually set to equal the minimum number of decodes required before the Yellow stack light turns on and the Reader is considered a Low Read. The default value is 30(dec), this should be set to 0 if the reader is configured send immediate (non-standard).
Step #5: If the reader is connected via DeviceNet enter the DeviceNet Network number and Node number in N286:13. This word only need be configured if N286:11/04 is also set. Each value needs to be set in binary, see below of details.

- N286:13/00 – DeviceNet Network # (Binary value 1)
- N286:13/01 – DeviceNet Network # (Binary value 2)
- N286:13/02 – DeviceNet Network # (Binary value 4)
- N286:13/03 – Reserved
- N286:13/04 – Reserved
- N286:13/05 – Reserved
- N286:13/06 – Reserved
- N286:13/07 – Reserved
- N286:13/08 – DeviceNet Node # (Binary value 1)
- N286:13/09 – DeviceNet Node # (Binary value 2)
- N286:13/10 – DeviceNet Node # (Binary value 4)
- N286:13/11 – DeviceNet Node # (Binary value 8)
- N286:13/12 – DeviceNet Node # (Binary value 16)
- N286:13/13 – DeviceNet Node # (Binary value 32)
- N286:13/14 – Reserved
- N286:13/15 – Reserved

Step #6: Enter the Module number that the device communicates with in N286:14. The value in this word should be manually set to equal the Module block number. This number relates to the N275 datable address that the Module block is configured in. Each Module block is 10 words long, starting at word N275:10 for the first module, if this block is to be configured to receive data from this device then a 1 would be entered here. The second Module block configuration starts in N275:20, if this block is to be configured to receive data from this device then a 2 would be entered here, the third Module block starts in N275:30, if this is the one to be used then a 3 would be entered here, and so on. The default value is 1, 0 – 10 (dec) is valid.

Step #7: Enter the Module Port number that the Device is attached to in the lower byte of N286:15. The value in this byte should be manually set to equal the Port number that is labeled next to the port being used by this device. 0-3 (dec) is valid. The upper byte will set by the driver once it’s running.

Step #8: Enter the Request Block number that this device corresponds with in N286:16. The value in this word should be manually set to equal the Request Block number that this device corresponds with. The default value is 1, 0 – 15 (dec) is valid.

Step #9: Return to Step #2: if N275:111=2 (or greater), offset addresses for additional Devices according to instructions at the beginning of this section.

Step #10: Goto section 2.1 General Configuration, Step #4.
2.4 RB/DB Module Configuration

This section explains how to go about configuring the (RB/DB) Module Block portion of the AVI driver. The addresses shown starting at 'Step #1:' are for the first Module Block only, add 10 words to each address per additional Module Block for configuring additional modules. Example, configuration of the second Module Block would start at N275:20, the third would start at N275:30, etc… Up to 10 devices are supported.

<table>
<thead>
<tr>
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<th>Block #</th>
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<td>6</td>
<td>60-69</td>
<td>8</td>
<td>80-89</td>
</tr>
</tbody>
</table>

Step #1: Enter the Module Rack number in N275:10. The value in this word should be manually set to equal the physical Rack location of the Module. 0-17 (dec) is valid if the PLC is a 5/40 (or lower), 0-27 (dec) is valid if PLC is a 5/60 (or higher).

Step #2: Enter the Module Group number in N275:11. The value in this word should be manually set to equal the physical Group location of the Module. 0-7 (dec) is valid.

Step #3: Enter the Module Slot number in N275:12. The value in this word should be manually set to equal the physical Slot location of the Module. 0-1 (dec) is valid.

Step #4: Enter the Module type information in N275:13. See below for the list of options and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

N275:13/00 – RB Module
N275:13/01 – DB Module
N275:13/02 – Module Enable

Step #5: Enter the Port 1 Device Block number in N275:14. The value in this word should be manually configured to equal the Device Block number of the device that is attached to Port 1 of this module. (see 2.3 Device Configuration, Step #6:)

Step #6: Enter the Port 2 Device Block number in N275:15. The value in this word should be manually configured to equal the Device Block number of the device that is attached to Port 2 of this module. (see 2.3 Device Configuration, Step #6:)

Step #7: Enter the Port 3 Device Block number in N275:16. The value in this word should be manually configured to equal the Device Block number of the device that is attached to Port 3 of this module. (see 2.3 Device Configuration, Step #6:)

Note: Make sure the values of N275:14, N275:15 and N275:16 are all different, if any one of these values is the same as another then a configuration mistake has been made.

Step #8: Enter the Module communication Block Transfer size in N275:17. The value of this word should always be manually set to equal 64 (dec) unless otherwise instructed by an APIC Systems representative.

Step #9: Return to 'Step #1:' if N275:112=2 (or greater), offset addresses for additional Modules according to instructions at the beginning of this section.

Step #10: Enable the Module initialization by setting N275:122/02=1. This will initiate the Module configuration once the AVI driver is enabled. This bit will automatically be reset and the values in N275:10-N275:12 and N275:17 will be loaded into the corresponding Module Block “Block Transfer” control address. Word N275:13 will also be copied into the high byte of the fifth word of the corresponding Device Block (N286:15, N286:65, N286:115, etc…). Module Block “Block Transfers” will begin communicating when initialization is successfully completed.

Step #11: Goto section 2.1 General Configuration, Step #5.
2.5 PanelView Configuration

This section explains how to configure PanelView Block portion of the AVI driver. The addresses shown starting at **Step #1** are for the first PanelView Block only, add 10 words to each address per additional PanelView Block for configuring additional PanelViews. Example, configuration of the second PanelView Block would start at N275:220, the third would start at N275:230, etc… Up to 10 PanelViews are supported.

<table>
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<tr>
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<tr>
<td>2</td>
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**Step #1:** Enter the PanelView AVI Block Transfer Read Rack number in N275:210. The value in this word should be manually set to equal the PanelView AVI Block Transfer Read Rack location. 0-17 (dec) is valid if the PLC is a 5/40 (or lower), 0-27 (dec) is valid if PLC is a 5/60 (or higher).

**Step #2:** Enter the PanelView AVI Block Transfer Read Group number in N275:211. The value in this word should be manually set to equal the PanelView AVI Block Transfer Read Group location of the PanelView. 0-7 (dec) is valid.

**Step #3:** Enter the PanelView AVI Block Transfer Read Slot number in N275:212. The value in this word should be manually set to equal the PanelView AVI Block Transfer Read Slot location of the PanelView. 0-1 (dec) is valid.

**Step #4:** Enter the PanelView AVI Block Transfer Write Rack number in N275:213. The value in this word should be manually set to equal the PanelView AVI Block Transfer Write Rack location. 0-17 (dec) is valid if the PLC is a 5/40 (or lower), 0-27 (dec) is valid if PLC is a 5/60 (or higher).

**Step #5:** Enter the PanelView AVI Block Transfer Write Group number in N275:214. The value in this word should be manually set to equal the PanelView AVI Block Transfer Write Group location of the PanelView. 0-7 (dec) is valid.

**Step #6:** Enter the PanelView AVI Block Transfer Write Slot number in N275:215. The value in this word should be manually set to equal the PanelView AVI Block Transfer Write Slot location of the PanelView. 0-1 (dec) is valid.

**Step #7:** Configure the PanelView type information in N275:216. See below for the list of options and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

- N275:216/00 – PanelView Enable
- N275:216/01 – Future
- N275:216/02 – PanelView is Type 1200e Touchscreen
- N275:216/03 – PanelView is Type 1200e Keypad
- N275:216/04 – PanelView is Type 1000e or 1400e Touchscreen
- N275:216/05 – PanelView is Type 1000e or 1400e Keypad
- N275:216/06 – Future
- N275:216/07 – Future
- N275:216/08 – Future
- N275:216/09 – Future
- N275:216/10 – Future
- N275:216/11 – Future
- N275:216/12 – Future
- N275:216/13 – Future
- N275:216/14 – Future
- N275:216/15 – Non-PanelView HMI (Not Supported by AVI)

**Step #8:** Return to **Step #1** if N275:113=2 (or greater), offset addresses for additional PanelViews according to instructions at the beginning of this section.
Step #9: Enable the PanelView initialization by setting \textbf{N275:122/03}=1. This will initiate the PanelView configuration once the AVI driver is enabled. This bit will automatically be reset and the values in N275:210-N275:215 will be loaded into the corresponding PanelView Block “Block Transfer” control address. PanelView Block “Block Transfer” will begin communicating when initialization is successfully completed.

Step #10: Enable the AVI PanelView logic processing by setting \textbf{N275:120/01}=1.

Step #11: Goto section 2.1 General Configuration, Step #6.
2.6 Sensor Block Configuration

This section explains how to go about configuring the Sensor Block portion of the AVI driver. The addresses shown starting at ‘Step #2:’ are for the first Sensor Block only, add 10 words to each address per additional Sensor Block. Example, configuration of the second Sensor Block would start at N281:20, the third would start at N281:30, etc… Up to 99 Sensor Blocks are supported.

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</table>

**Step #1:** Size the Sensor Block (N281) datafile. Modify the memory size (number of Elements) in the Sensor Block datafile N281. The size (in Element) can be calculated by using this formula: \((N275:114 \times 10) + 10\).

**Step #2:** Enter the Sensor ID (same as Point ID) number in **N281:10**. The value in this word should be manually set to equal the point number that the Sensor Block is associated with. This number must be no longer than four decimal digits. Sensor Blocks should be configured in ascending order per PLC starting with the Sensor ID number (if possible).

**Step #3:** Enter the Index number in **N281:11**. The value in this word should be manually set to equal the Index value (optional) that is to be sent to the workcell when this Sensor Block has been cycled. This value should be a constant, if multiple Index numbers are required, then multiple Sensor Blocks should be configured.
**Step #4:** Configure the Sensor Block option(s) in N281:12. See below for the list of options and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

- N281:12/00 – Photo Eye Present
- N281:12/01 – Clear data at Point Enable
- N281:12/02 – Index Enable
- N281:12/03 – Index is Safe Buffered (requires Safe Buffer configuration)
- N281:12/04 – Vehicle Update Enable
- N281:12/05 – Vehicle Update is Safe Buffered (requires Safe Buffer configuration)
- N281:12/06 – Spare
- N281:12/07 – Spare
- N281:12/08 – Configurable Vehicle ID on Leaving Enable (see Step #7)
- N281:12/09 – Spare
- N281:12/10 – Spare
- N281:12/11 – Spare
- N281:12/12 – Spare
- N281:12/13 – Spare
- N281:12/14 – Spare
- N281:12/15 – Spare

**Step #5:** Enter the Request Block number that this Sensor Block corresponds with in N281:15. The default value is 1, 0 – 15 (dec) is valid.

**Step #6:** If changing the Vehicle ID of the Index or Vehicle Update message is required enter the starting word number of the Response Block data for the new Vehicle ID in N281:16. For example, if the new Vehicle ID data is in word N284:12 the value entered into N281:16 would be “2”, if the data is in word N284:13 the value entered into N281:16 would be “3”, and so on. (N281:16 always works in conjunction with N281:17, see next step)

**Step #7:** If changing the Vehicle ID of the Index or Vehicle Update message is required enter the Header information of the new Vehicle ID in N281:17. 0 – 15 (dec) is valid.

**Step #8:** Return to Step #2: if N275:114=2 (or greater), offset addresses for additional Sensor Blocks according to instructions at the beginning of this section.

**Step #9:** Goto section 2.1 General Configuration, Step #7.
2.7 AVI Workcell Communication Configuration

This section explains how to establish communications with the AVI workcell. The plant-floor PLC will be able to communicate with the AVI workcell using two methods. The only currently supported communication type is Remote I/O using a Direct Communication Module (DCM), Ethernet is supported at this time. The communication type specified is per PLC, it is not possible to specify a different method of communication per point.

<p>| Workcell Input Data File: N284 |
|-------------------------------|------------------|------------------|------------------|------------------|</p>
<table>
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<td>9</td>
<td>250-279</td>
<td>12</td>
<td>340-369</td>
</tr>
</tbody>
</table>

**Step #1:** Size the Workcell Input N284 datafile. Modify the memory size (number of Elements) in the Workcell Input datafile N284. The size (in Element) can be calculated by using this formula: \((N275:110*30)+10\).

**Step #2:** Enter the Point ID into N284:10. The value in this word shall be manually set to equal the Point number of the associated Request Block.

**Step #3:** Size the Workcell Output N285 datafile. Modify the memory size (number of Elements) in the Workcell Output datafile N285. The size (in Element) can be calculated by using this formula: \((N275:110*30)+10\). The size of N285 must always equal the size of N284.

**Step #4:** Enter the Point ID into N285:10. The value in this word shall be manually set to equal the Point number of the associated Request Block.

**Step #5:** Configure the communication type. For instructions on setting up Ethernet communication goto sub-section 2.7.1 Ethernet Communications (Future Possibility)’. For instructions on setting up RIO communication using a Direct Communication Module (DCM) goto sub-section 2.7.2 DCM (RIO) Communications’

*Note: DCM communication also requires additional configuration to the AVI Supervisor PLC if this is a new floor PLC.*
2.7.1 Ethernet Communications (Future Possibility)

This feature is not currently supported.

2.7.2 DCM (RIO) Communications

Step #1: Enter the Communication Type in N275:121. The value in this word should be manually set to equal ‘1’.

Step #2: Enter the DCM Rack number in N275:150. The value in this word should be manually set to equal the physical Rack location of the DCM Card. 0-17 (dec) is valid if the PLC is a 5/40 (or lower), 0-27 (dec) is valid if PLC is a 5/60 (or higher).

Step #3: Enter the DCM Group number in N275:151. The value in this word should be manually set to equal the physical Group location of the DCM Card. 0-7 (dec) is valid.

Step #4: Enter the DCM Slot number in N275:152. The value in this word should be manually set to equal the physical Slot location of the DCM. 0-1 (dec) is valid.

Step #5: Enter the DCM communication Block Transfer size in N275:153. The value of this word should always be manually set to equal 32 (dec) unless otherwise instructed by an APIC Systems representative.

Step #6: Enter the RIO Link timeout preset in N275:155. The value in this word should be manually set to equal the desired time delay (in milliseconds) before a communication fault is declared. The default value for this word is 3000 (dec), this is equal to three seconds.

Step #7: Enable the DCM initialization by setting N275:122/04=1. This will initiate the DCM configuration once the AVI driver is enabled. This bit will automatically be reset and the values in N275:150-N275:153 and N275:155 will be loaded into the DCM “Block Transfer” control address. DCM “Block Transfers” will begin communicating when initialization is successfully completed, this can be verified by a GREEN “BPLN” (Backplane) indicator on the DCM card.

Note: This is only part of the overall DCM Communication configuration. See “Supervisor_config_multistate.doc” for information on how to configure the AVI Supervisor PLC.

Step #8: Goto section 2.1 General Configuration, Step #8.
2.8 Safe Buffer Configuration

This section explains how to configure the Safe Buffer portion of the AVI driver. The Safe Buffer works by storing data before it is sent to the workcell. In the event of a communication loss the PLC will continue to store data and will automatically update the workcell with this data as soon as communication is re-established. Not all message types support Safe Buffering, typical applications include ‘Index’ and ‘Vehicle Update’ messages. If communication is down for an extended period of time (duration depends on Safe buffer size and message size) then the safe buffer will “wrap” and the oldest data will be overwritten and lost. Refer to the AVI Point Document for details.

Step #1: Size Safe Buffer (N293) Datafile(s). Change the number of Safe Buffer Datafile (N293) Elements to the size specified in the Point Document. Typically 1000 words (max). ONLY N293 SHOULD BE CONFIGURED UNLESS OTHERWISE INSTRUCTED BY AN APIC SYSTEMS REPRESENTATIVE.

Step #2: Enter the Last (N293) word number to be scanned in N293:0. The value in this word should be manually set no higher than 980 (dec). See Point Document for actual size.

Step #3: Enter the Safe Buffer timeout preset in N275:177. The value in this word should be manually set to equal the desired time delay (in milliseconds) before a message is retried from the safe buffer. Example, if the timeout preset is set to three seconds then a Safe Buffered message retry will occur every three seconds the entire duration communication is down until communications are restored. The default value for this word is 3000 (dec), this is equal to three seconds.

Step #4: Enable the Safe Buffer initialization by setting N275:122/01=1. This will initiate the Safe Buffer once the AVI driver is Enabled. This bit will automatically be reset and a value of ‘–1’ will be copied into each configured Safe Buffer storage location word (N293:10 through N293:[N293:0]) when initialization is successfully completed.

Step #5: Goto section 2.1 General Configuration, Step #9.
2.9 AVI FIS Data Block Configuration

This section explains how to go about configuring the required AVI FIS Data Blocks. This section should not be confused with “USD FIS Configuration”. The AVI system reports directly to the FIS system using two different types of “Data Blocks”, each type reports different information. The first type is the “Request Data Block”, this Data Block reports things such as AVI System faults along with overall Point and Sensor faults. There should be one “Request Data Block” configured for each Request Block. The second type of Data Block is called the “Reader Data Block”, this Data Block reports things such as (Barcode) Reader faults and reader statistics. There should be one “Reader Data Block” configured for each Reader.

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</tbody>
</table>

Step #1: Size the FIS Request Data Block (N87) datafile. Modify the memory size (number of Elements) in the FIS Request Data Block datafile N87. The size (in Element) can be calculated by using this formula: N275:111*30.

Step #2: Size the FIS Reader Data Block (N88) datafile. Modify the memory size (number of Elements) in the FIS Reader Data Block datafile N88. The size (in Element) can be calculated by using this formula: N275:111*30.

Step #3: Enter the number of Scans Between Execution of the FIS Data Block Population routine in N275:180. The value in this should always be equal to '1' unless PLC scan time is very high, consult an APIC Systems representative before changing this value.

Step #4: Enter the number of Request Data Blocks to process in one scan (before Leaving) in N275:181. The number of Request Data Blocks to process tells the driver how many Request Data Blocks to process once the driver has jumped to the Data Block Population routine before processing the Reader Blocks. This variable allows splitting up the processing of the Request and Reader Blocks. This is to be done only when scan time is an issue.

Step #5: Enter the number of Reader (Device) Data Blocks to process in one scan (before Leaving) in N275:182. The number of Reader Data Blocks to process tells the driver how many Reader Data Blocks to process once the driver has jumped to the Data Block Population routine before processing the Reader Blocks. This is to be done only when scan time is an issue.

Step #6: Enable the processing of the AVI FIS Data Block logic by setting N275:120/02=1.

Step #7: Goto section 2.1 General Configuration, Step #10:
2.10 AVI Special Application Configuration

This section explains how to go about configuring the different AVI “Special Applications”. These are defined as “Special” because each application is designed specifically for a certain task. Each one of these applications requires an additional PLC program paste file and PanelView screen (except for Schedule Request). See sub-sections below for more details on each Special Application.

2.10.1 Schedule Request Configuration

This section explains how to configure a Schedule Request point. Each Schedule Request point uses one Request Block with a Schedule Request message type. Refer to the Point Document for more details. The addresses shown starting at ‘Step #2:’ are for the first Schedule Request Block only, add 80 words to each address per additional Schedule Request Block. Example, configuration of the second Schedule Request would start at N296:90, the third would start at N296:170, etc… Up to 12 Schedule Request Blocks are supported. Each Schedule Request point will also require additional OEM logic, refer to the Point Document for more details.

Step #1: Size the Schedule Request Block (N296) datafile. Modify the memory size (number of Elements) in the Schedule Request Block datafile N296. The size (in Element) can be calculated by using this formula: (Number of Schedule Request Points*80)+10.

Step #2: Verify the Request Block Option “Schedule Request” is Enabled. (This should have already been done earlier in the configuration.) See section ‘2.1 General Configuration’, ‘Step #8:’, bit ‘N282:x1/03’.

Step #3: Enter the Total number of Detected Types in N296:20. The value in this word shall be manually set to equal the total (dec) number of detected part types entering the station. 0 – 16 is valid.

Step #4: Enter the actual numeric value of each Detected Type into N296:21 – N296:36. The values in these words shall be manually set to equal the (dec) number of each detected part type. See below for the corresponding AVI type.

N296:21 – Type #1 Detected Config Word
N296:22 – Type #2 Detected Config Word
N296:23 – Type #3 Detected Config Word
N296:24 – Type #4 Detected Config Word
N296:25 – Type #5 Detected Config Word
N296:26 – Type #6 Detected Config Word
N296:27 – Type #7 Detected Config Word
N296:28 – Type #8 Detected Config Word
N296:29 – Type #9 Detected Config Word
N296:30 – Type #10 Detected Config Word
N296:31 – Type #11 Detected Config Word
N296:32 – Type #12 Detected Config Word
N296:33 – Type #13 Detected Config Word
N296:34 – Type #14 Detected Config Word
N296:35 – Type #15 Detected Config Word
N296:36 – Type #16 Detected Config Word

Step #5: Enter the Total number of As Built Types in N296:40. The value in this word shall be manually set to equal the total (dec) number of As Built part types leaving the station. 0 – 16 is valid.
Step #6: Enter the actual numeric value of each As Built Type into N296:41 – N296:56. The values in these words shall be manually set to equal the (dec) number of each As Built part type. See below for the corresponding AVI type.

- N296:41 – Type #1 As Built Config Word
- N296:42 – Type #2 As Built Config Word
- N296:43 – Type #3 As Built Config Word
- N296:44 – Type #4 As Built Config Word
- N296:45 – Type #5 As Built Config Word
- N296:46 – Type #6 As Built Config Word
- N296:47 – Type #7 As Built Config Word
- N296:48 – Type #8 As Built Config Word
- N296:49 – Type #9 As Built Config Word
- N296:50 – Type #10 As Built Config Word
- N296:51 – Type #11 As Built Config Word
- N296:52 – Type #12 As Built Config Word
- N296:53 – Type #13 As Built Config Word
- N296:54 – Type #14 As Built Config Word
- N296:55 – Type #15 As Built Config Word
- N296:56 – Type #16 As Built Config Word

Step #7: Goto section 2.1 General Configuration, Step #11:
2.10.2 Marriage Configuration

This section explains how to configure the common aspects of a Marriage point. Each Marriage point may be unique and may require additional OEM logic, refer to the Point Document for more details. Only one Marriage point is allowed per PLC at this time.

Step #1: Paste Marriage application into program file 97.

Step #2: Verify the Request Block Option “Marriage Request” is Enabled. (This should have already been done earlier in the configuration.) See section ‘2.1 General Configuration’, ‘Step #8’, bit ‘N282:x0/03’.

Step #3: Enter the Style Number in N297:10. (If multiple styles are to be used then this step shall be skipped and logic must be added to OEM file 80 to generate the style number instead.)

Step #4: Enter the Point ID number in N297:11. The value in this word should be manually set to equal the point number that the Marriage Block is associated with. This number must be no longer than four decimal digits.

Step #5: Enter the Main Device Block in N297:12. The value in this word should be manually set to equal the Main Device (Reader) block number. This number relates to the N286 datable address that the Main Device is configured in. Each Device block is 50 words long, starting at word N286:10 for the first device, if this block is the Main device for this point then a 1 would be entered here. If the Main device configuration starts in word N286:60, then a 2 would be entered here, if configuration starts in N286:110 then a 3 would be entered, and so on.

Step #6: Enter the first Backup Device Block in N297:13. The value in this word should be manually set to equal the Main Device (Reader) block number. This number relates to the N286 datable address that the Main Device is configured in. Each Device block is 50 words long, starting at word N286:10 for the first device, if this block is the Main device for this point then a 1 would be entered here. If the Main device configuration starts in word N286:60, then a 2 would be entered here, if configuration starts in N286:110 then a 3 would be entered, and so on.

Step #7: Enter the second Backup Device Block in N297:14. The value in this word should be manually set to equal the Main Device (Reader) block number. This number relates to the N286 datable address that the Main Device is configured in. Each Device block is 50 words long, starting at word N286:10 for the first device, if this block is the Main device for this point then a 1 would be entered here. If the Main device configuration starts in word N286:60, then a 2 would be entered here, if configuration starts in N286:110 then a 3 would be entered, and so on.

Step #8: Enter the PanelView number that has the Marriage screen loaded in N297:17. The value in this word should be manually set to equal the PanelView number that the Marriage screen resides in (only one per PLC is allowed). 0 - 10 (dec) is valid.

Step #9: Enter the Sensor Block number that the Marriage point corresponds with in N297:18. The value in this word should be manually set to equal the Sensor Block the Marriage point corresponds with. 0 – 99 (dec) is valid.

Step #10: Enter the Marriage type information in N297:20. See below for the list of options and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

<table>
<thead>
<tr>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N297:20/00</td>
<td>Automatic Marriage</td>
</tr>
<tr>
<td>N297:20/01</td>
<td>Manual Marriage</td>
</tr>
</tbody>
</table>

Step #11: Goto section 2.1 General Configuration, Step #11.
### 2.10.3 Style Setup (Get Next) Configuration

This section explains how to configure a Style Setup point. Each Style Setup point uses one Request Block with a Get Next message type. Refer to the Point Document for more details. The addresses shown starting at ‘Step #4’ are for the first Style Setup Block only, add 50 words to each address per additional Style Setup Block. Example, configuration of the second Style Setup would start at N298:250, the third would start at N298:300, etc… Up to 5 Style Setup Blocks are supported.

<table>
<thead>
<tr>
<th>Block #</th>
<th>Word</th>
<th>Block #</th>
<th>Word</th>
<th>Block #</th>
<th>Word</th>
<th>Block #</th>
<th>Word</th>
<th>Block #</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200-249</td>
<td>2</td>
<td>250-299</td>
<td>3</td>
<td>300-349</td>
<td>4</td>
<td>350-399</td>
<td>5</td>
<td>400-449</td>
</tr>
</tbody>
</table>

#### Step #1:
Paste Style Setup application into program file 98.

#### Step #2:
Size the Style Setup GN (N298) datafile. Modify the memory size (number of Elements) in the Style Setup GN datafile N298. The size (in Element) can be calculated by using this formula: (Number of Style Setup GN blocks*50)+200.

#### Step #3:
Verify the Request Block Option “Point as a Set-up Point GN only” is Enabled. (This should have already been done earlier in the configuration.) See section ‘2.1 General Configuration’, ‘Step #8’, bit ‘N282:x0/08’.

#### Step #4:
Enter the Point ID number in N298:250. The value in this word should be manually set to equal the point number that the Style Setup point is associated with. This number must be no longer than four decimal digits.

#### Step #5:
Enter the total number of Style Types that can be built at this Style Setup point in N298:252. The value in this word should be equal to the total number of Styles that may be built at this point. 0 – 15 (dec) is valid.

#### Step #6:
Enter the Workcell Response word number that is to contain the Style Type information in N298:253. This information can be found in the Point Document.

#### Step #7:
Enter the Byte Location of the Workcell Response word number that is to contain the Style Type information in N298:254. This information can be found in the Point Document. If Low Byte then N298:254=0, if High Byte then N298:254=1.

#### Step #8:
Enter the First workcell Response word number that is to contain the Sequence number information in N298:255. Example, if the Sequence number is to be in word 14 & 15 of the response data then a ‘14’ would be entered here. This information can be found in the Point Document.

#### Step #9:
Enter the Request Header (data type) information in N298:257. The value in this word will determine what the workcell will “Get Next” on. Example, if a ‘12’ is entered then the workcell will return the next ‘Gateline Sequence’ number in the response based on the current sequence number sent. This information can be found in the Point Document. See below for the list of options and their corresponding values.

- N298:257 = 00 - None
- N298:257 = 01 – Primary Label
- N298:257 = 02 – VIN
- N298:257 = 03 – Secondary Label
- N298:257 = 04 – Tertiary Label
- N298:257 = 05 – Frame Sequence
- N298:257 = 06 – BC Last Tracked Sequence
- N298:257 = 07 – Trim Sequence
- N298:257 = 08 – Alternate Sequence
- N298:257 = 09 – VON
- N298:257 = 10 – Broadcast Status
- N298:257 = 11 – VIN Spec
- N298:257 = 12 – Gateline Sequence
- N298:257 = 13 – Gap
- N298:257 = 14 – Carrier ID
- N298:257 = 15 – Empty Carrier

#### Step #10:
Goto section 2.1 General Configuration, Step #11:
2.10.4 Get Specific / Get Next Compare Configuration

This section explains how to go about configure a GS-GN Compare point. Each GS-GN Compare point uses two Request Blocks. The first Request Block message type should be configured as a Get Specific, the second should be configured as a Get Next. This section only describes the configuration required that is unique to a GS/GN Compare point, it does not describe Refer to the Point Document for more details. The addresses shown starting at ‘Step #4’ are for the first GS/GN Compare Block only, add 50 words to each address per additional GS/GN Compare Block. Example: configuration of the second GS/GN Compare would start at N299:450, the third would start at N299:500, etc… Up to 5 GS/GN Compare Blocks are supported.

<table>
<thead>
<tr>
<th>Block #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Range</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

Step #1: Paste the GS-GN application into program file 99. Verify the required Request Block Options are Enabled. (This should have already been done earlier in the configuration.) See section ‘2.1 General Configuration’, ‘Step #8’, bits N282:x0/11 and N282:x0/12.

Step #2: Size the GS-GN Compare (N299) datafile. Modify the memory size (number of Elements) in the GS-GN Compare N299. The size (in element) can be calculated by using this formula: (Number of GS-GN blocks*50)+400.

Step #3: Enter the Get Specific Point ID number in N299:400. The value in this word should be manually set to equal the point number that the Get Specific point is associated with. This number must be no longer than four decimal digits.

Step #4: Enter the Get Specific Request Block number in N299:401. The value in this word should be manually set to equal the Get Specific Request Block number. 0 – 15 (dec) is valid.

Step #5: Enter the Get Specific Sensor Block number in N299:402. The value in this word should be manually set to equal the Sensor Block number that the Get Specific is associated with. 0 – 99 (dec) is valid.

Step #6: Enter the Get Specific Starting (first) workcell response word number that is to contain the (Body) Label number information in N299:403. Example, if the Label number is to be in word 12 & 13 of the response data then a ‘12’ would be entered here. This information can be found in the Point Document.

Step #7: Enter the Get Specific Starting (first) workcell response word number that is to contain Sequence number information in N299:404. Example, if the Sequence number is to be in word 16 & 17 of the response data then a ‘16’ would be entered here. This information can be found in the Point Document.

Step #8: Enter the Get Specific Starting (first) workcell response word number that is to contain VIN number information in N299:405. Example, if the VIN number is to be in word 14 & 15 of the response data then a ‘14’ would be entered here. This information can be found in the Point Document.

Step #11: Enter the Get Specific Vehicle ID type information in N299:407. The value in this word will determine what information is sent to the workcell (using the Get Specific request) if the “Press if GN Valid” pushbutton is pressed. This should be configured to send the same data as it does in automatic mode. See below for the list of options and their corresponding enable values.

N299:407 = 01 – Primary Label
N299:407 = 02 – VIN

Step #9: Enter the Get Next Point ID number in N299:410. The value in this word should be manually set to equal the point number that the Get Next point is associated with. This number must be no longer than four decimal digits.

Step #10: Enter the Get Next Request Block number in N299:411. The value in this word should be manually set to equal the Get Next Request Block number. 0 – 15 (dec) is valid.

Step #11: Enter the Get Next Sensor Block number in N299:412. The value in this word should be manually set to equal the Sensor Block number that the Get Next is associated with. 0 – 99 (dec) is valid.

Step #12: Enter the Get Next Starting (first) workcell response word number that is to contain the (Body) Label number information in N299:413. Example, if the Label number is to be in word 12 & 13 of the response data then a ‘12’ would be entered here. This information can be found in the Point Document.
**Step #13:** Enter the Get Next Starting (first) workcell response word number that is to contain Sequence number information in **N299:414**. Example, if the Sequence number is to be in word 16 & 17 of the response data then a ‘16’ would be entered here. This information can be found in the Point Document.

**Step #14:** Enter the Get Next Starting (first) workcell response word number that is to contain VIN number information in **N299:415**. Example, if the VIN number is to be in word 14 & 15 of the response data then a ‘14’ would be entered here. This information can be found in the Point Document.

**Step #15:** Configure the GS_GN Block option(s) in **N299:430**. See below for the list of options and their corresponding enable bits. Set address value to ‘1’ to enable, set ‘0’ to disable.

<table>
<thead>
<tr>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N299:430/00</td>
<td>Get Specific Enable</td>
</tr>
<tr>
<td>N299:430/01</td>
<td>Get Next Every Job Enable</td>
</tr>
<tr>
<td>N299:430/02</td>
<td>Spare</td>
</tr>
<tr>
<td>N299:430/03</td>
<td>Spare</td>
</tr>
<tr>
<td>N299:430/04</td>
<td>Auto Release- Get Specific on Partial data</td>
</tr>
<tr>
<td>N299:430/05</td>
<td>Auto Release- Get Specific fix Mismatch</td>
</tr>
<tr>
<td>N299:430/06</td>
<td>Auto Release- Get Next fix Mismatch</td>
</tr>
<tr>
<td>N299:430/07</td>
<td>Auto Release- Get Next fix No Read</td>
</tr>
<tr>
<td>N299:430/08</td>
<td>Auto Release- Enable</td>
</tr>
<tr>
<td>N299:430/09</td>
<td>Spare</td>
</tr>
<tr>
<td>N299:430/10</td>
<td>Auto Release- Consecutive Maximum GS Releases Enable</td>
</tr>
<tr>
<td>N299:430/11</td>
<td>Auto Release- Get Next fix No Read Mode Manual PB Enable</td>
</tr>
<tr>
<td>N299:430/12</td>
<td>Empty Carrier Verify Manual PB Enable</td>
</tr>
<tr>
<td>N299:430/13</td>
<td>Empty Carrier Auto Verify by OEM Enable</td>
</tr>
<tr>
<td>N299:430/14</td>
<td>Spare</td>
</tr>
<tr>
<td>N299:430/15</td>
<td>GS-GN Compare used without QAS Application</td>
</tr>
</tbody>
</table>

**Step #16:** Enter the Consecutive Maximum GS Releases in word **N299:437**. This is only required if N299:430/10 is also configured.

**Step #17:** Goto section **2.1 General Configuration, Step #11**.
3 USD AVI Addresses - Quick Reference Guide

3.1 Enable bits

N275:120/00 – Driver Enable
This bit enables the AVI driver. Default is 0.

N275:120/01 – PanelView Enable
This bit enables the PanelView logic. Default is 0.

N275:120/02 – FIS Data Block Enable
This bit enables the FIS Data Block Population Logic. Default is 0.

3.2 Initialization bits

N275:122/00 – Initiate Output Buffer
This bit is to initialize the Output Buffer. When this bit is set the driver sets all words in the Output Buffer to –1’s, and then sets the Output Buffer pointers to 1, and then it sets the number of free words in the Output Buffer to the number that it is configured for. This is usually 300. Any messages that were in the output buffer are removed when the Output Buffer is initialized. This bit is set when the configuration tool configures the driver for the first time. Default is 1.

N275:122/01 – Initiate Safe Buffer
This bit is to initialize the safe buffer files. When this bit is set the driver sets the safe buffer files that are configured to –1’s and sets the load and unload pointers to the beginning of the first safe buffer file. This bit is set if the configuration tool loads or modifies any safe buffer configuration. Default is 1.

N275:122/02 – Initiate Module RGS Configuration
This bit is to initialize all the module block transfers. When this bit is set the driver takes the rack, group, and slot values from the general configuration data file (N275:) and puts them into the block transfers for the modules. And then it configures word #5 in the Device Block which is the RB/DB/Port # word. This bit is set if the configuration tool loads or modifies any module configuration. Default is 1.

N275:122/03 – Initiate PanelView RGS Configuration
This bit is to initialize all the PanelView block transfers. When this bit is set the driver takes the rack group, and slot values from the general configuration data file (N275:) and puts them into the block transfers for the PanelViews. This bit is set if the configuration tool loads or modifies any PanelView configuration. Default is 1.

N275:122/04 – Initiate DCM RGS Configuration
This bit is to initialize the DCM block transfers. When this bit is set the driver takes the rack, group, and slot values from the general configuration data file (N275:) and puts them into the DCM block transfers. This bit is set if the configuration tool loads or modifies any DCM configuration. Default is 1.

N275:122/15 – Initiate AVI Configuration
This bit is to initialize the pointers that contain the datatable sizes of N281, N282, N284, N285, N286, N291. When this bit is set the driver calculates these sizes based on the configuration of N275:110 through N275:114. This bit is set if the configuration tool loads or modifies any DCM configuration. Default is 1.

3.3 Safe Buffer configuration

N275:124/00 – Enable Safe Buffer
This bit enables the safe buffer. If this bit is off and there is a message in the safe buffer there is a FIS bit that is set to alarm that there is a message stuck in the safe buffer. This bit is also set if the disable unload safe buffer bit is on and there is a message stuck in the safe buffer. Default is 0.

N275:124/01 – Disable Safe Buffer Load
This bit disables the loading of the safe buffer. This bit is set only when there needs to be manual intervention into the safe buffer operation. Usually this bit is not set. Default is 0.

N275:124/02 – Disable Safe Buffer Unload
This bit disables the loading of the safe buffer. This bit is set only when there needs to be manual intervention into the safe buffer operation. Usually this bit is not set. Default is 0.
### 3.4 Reference addresses

**N275:000** – Last word used in this file

The value in this word shall equal the last word number to be scanned in the N275 data file. The default value is 499 (dec).

**N275:120/15** – Always Off Bit. This bit is always off.

### 3.4.1 Modules

**N278:201 – N278:264** - Module BTR Buffer Area

This is the buffer area that the block transfer read from the module is copied to work on in Prog File.

**N278:275** - Module Number From BTR

This number is the module number (1-10) that sent the BTR data to the Buffer area. With this number it is easy to reference the module configuration data.

**N278:70** - Module Has Data to Send Bits

These bits tell if the Module already has data in the BTW that is waiting to be sent.

### 3.4.2 Reader Control Strings

**Stack Light Read String** – This is the string that is sent to the module when the stack lights are to be set with the Green and the Blue light on, indicating a read.

**Stack Light No-Read String** – This is the string that is sent to the module when the stack lights are to be set with the Red light on, indicating a No-Read.

**Stack Light Low Decodes String** – This is the string that is sent to the module when the stack lights are to be set with the Blue, Green, and Yellow lights on, indicating a low decode read. A low decode read is declared after the vehicle has came into position. This string sets all three lights on since the green and blue light had to be on if the vehicle had been read.

**Stack Light Off String** – This is the string that is sent to the module when the stack lights are to be turned off. Usually when the vehicle leaves.

**Reader Beam On String** – This is the string that is sent to the module when the reader beam needs to be turned on.

**Reader Beam Off String** – This is the string to be sent to the module when the reader beam needs to be turned off. This is done when the vehicle leaves to insure that the beam is off.

**Reset RB Module String** – This is the string to be sent to reset an RB module if a fault is detected.

**N278:340 – N278:349** – DB/RB Stack Light Read String

**N278:350 – N278:359** – DB/RB Stack Light No-Read String

**N278:360 – N278:369** – DB/RB Stack Light Low Decodes String

**N278:370 – N278:379** – DB/RB Stack Light Off String

**N278:380 – N278:389** – DB/RB Reader Beam On String

**N278:390 – N278:399** – DB/RB Reader Beam Off String

**N278:400 – N278:409** – Reset RB Module String

**N278:640 – N278:649** – DEVCINET Stack Light Read String

**N278:650 – N278:659** – DEVCINET Stack Light No-Read String

**N278:660 – N278:669** – DEVCINET Stack Light Low Decodes String

**N278:670 – N278:679** – DEVCINET Stack Light Off String

**N278:680 – N278:689** – DEVCINET Reader Beam On String

**N278:690 – N278:699** – DEVCINET Reader Beam Off String
3.4.3 Output Buffer

N279:112 - Number of Free Words
This is the number of free words left in the output buffer file (N277)

N279:110 - Load Output Buffer Word Pointer
This is the word the output buffer logic will start at to load the next message into in the output buffer file (N277:1 - xxx).

N279:111 - Unload Output Buffer Word Pointer
This is the word the output buffer logic will start at to load the next message into in the output buffer file (N277:1 - xxx).

3.4.4 Safe Buffer

N275:170 – Number of Safe Buffer files
This value is the number of safe buffer files the driver is using. This number depends on the total number of words needed in the safe buffer. APICS personnel should be consulted on this number. Default is 0.

N275:171 – First Safe Buffer file number.
This value is the file number of the first safe buffer file. Default is 293.

N275:172 – This is the file number for the second safe buffer file
This value is the file number of the second safe buffer file. Default is 294.

N275:173 – This is the file number for the third safe buffer file
This value is the file number of the third safe buffer file. Default is 295.

N275:174 – This is the file number for the fourth safe buffer file
This value is the file number of the fourth safe buffer file. Default is 296.

N275:177 – This is the Retry Preset time in milliseconds
The value for this word is the retry time between sending the same message to the supervisor PLC or the WCC. This number is in milliseconds. Default is 3000.

N279:132 – Free Words in the Safe Buffer
This is the number of words left in the safe buffer.

N279:120 – Load Safe Buffer Word Pointer
This is the word the Safe Buffer logic will start at to load the next message into in the Safe Buffer.

N279:130 – Load Safe Buffer File Pointer
This is the file number that the Safe Buffer logic is using to load the next message into.

N279:121 – Unlock Safe Buffer Word Pointer
This is the word the Safe Buffer logic will start at to unload the next message from the safe buffer.

N279:131 – Unlock Safe Buffer File Pointer
This is the file number that the Safe Buffer logic will use to unload the next message from.
3.4.5 **System Information**

**N279:153** – Marriage Updates Safe Buffered
   This is the number of marriage updates that are in the safe buffer.

**N279:152** – Safe Buffer Count
   This is the total number of messages in the safe buffer.

**N278:75** – Time Stamp
   This is a free running register. Each scan the last scan time is added on.

**N279:151** - WCC Packet Number
   This is the sequence number of the last packet to go to the WCC.

**System Signals**

<table>
<thead>
<tr>
<th>Signal Description</th>
<th>Register</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Buffer Full</td>
<td>N279:150/00</td>
</tr>
<tr>
<td>Output Buffer Empty</td>
<td>N279:150/01</td>
</tr>
<tr>
<td>WCC Packet Sequence Error</td>
<td>N279:150/02</td>
</tr>
<tr>
<td>Safe Buffer Full</td>
<td>N279:150/03</td>
</tr>
<tr>
<td>Safe Buffer Empty</td>
<td>N279:150/04</td>
</tr>
<tr>
<td>Manual required at a point</td>
<td>N279:150/05</td>
</tr>
<tr>
<td>Safe Buffer Nearing Full Warning</td>
<td>N279:150/06</td>
</tr>
<tr>
<td>Driver OK</td>
<td>N279:160/00</td>
</tr>
<tr>
<td>Driver Faulted</td>
<td>N279:160/01</td>
</tr>
<tr>
<td>WCC OK</td>
<td>N279:160/02</td>
</tr>
<tr>
<td>WCC Faulted</td>
<td>N279:160/03</td>
</tr>
<tr>
<td>DCM BTX OK</td>
<td>N279:160/04</td>
</tr>
<tr>
<td>DCM BTX Faulted</td>
<td>N279:160/05</td>
</tr>
<tr>
<td>DCM RIO OK</td>
<td>N279:160/06</td>
</tr>
<tr>
<td>DCM RIO Faulted</td>
<td>N279:160/07</td>
</tr>
<tr>
<td>Safe Buffer Enabled</td>
<td>N279:160/08</td>
</tr>
<tr>
<td>Safe Buffer Warning</td>
<td>N279:160/09</td>
</tr>
<tr>
<td>Safe Buffer Full</td>
<td>N279:160/10</td>
</tr>
<tr>
<td>Manual Not Required</td>
<td>N279:160/11</td>
</tr>
<tr>
<td>Manual Required at another Point</td>
<td>N279:160/12</td>
</tr>
<tr>
<td>Manual Required at this Point</td>
<td>N279:160/13</td>
</tr>
<tr>
<td>Safe Buffer Unload Disabled and message stuck in safe buffer</td>
<td>N279:170/00</td>
</tr>
<tr>
<td>Safe Buffer Unload Disabled</td>
<td>N279:170/01</td>
</tr>
<tr>
<td>Safe Buffer Load Disabled</td>
<td>N279:170/02</td>
</tr>
<tr>
<td>Program Change Detected Memory</td>
<td>N279:170/03</td>
</tr>
</tbody>
</table>
4 Message Templates

Message Templates are for configuring a message that is sent to the WCC. In File N283: the message templates are configured. This type of configuration allows changing the message structure without changing the logic. The Message Templates do not have to be the same length. Each template is found by entering the start word of the template in a word starting at N275:401 for message type 1, N275:402 for message type 2 and so on. So if a Message Template is to be changed and the new template is too long for the location the old one is in; the message template can be moved as long as the corresponding word in N275:4__ is changed to reflect the new starting position of the Message Template. Message Templates work by entering a series of what is called Three Word Entries. A Three Word Entry is defined as: a File location in the first word, a word location in the second word and the length to copy in the third word. When the driver needs to create a message it goes to the corresponding word in N275:4__ and gets the start of the Message Template. Then it looks to see how many Three Word Entries the Message Template consists of. This is entered into the 4th word of the Message Template. Then the driver goes to the first Three Word Entry and gets the file and word number to start at. Then the driver gets the length to copy and copies the contents of those words into the message build area. The driver continues till there are no more Three Word Entries.

A break down of the Message Template structure is as follows:

- Word 0 the last address used in this file is entered into this word.
- Word 10 is the first word of the first Message Template. This word contains the message type the Template is for.
- Word 11 is the length of the message in words.
- Word 12 is spare.
- Word 13 is the number of Three Word Entries.
- Word 14 is the start of the first Three Word entry for this Template. It contains the File number the driver is going to start at.
- Word 15 is the second word of the first Three Word Entry. It contains the word address the driver is to start at.
- Word 16 is the length the driver is going to copy. The driver copies starting at the word in the second entry and copies the length (specified in this word) to the message build area.
- Word 17 is the start of the second Three Word Entry.

The driver continues to build the message using the rest of the Three Word Entries.
4.1 Message Template Configuration

Message Template start words are the word address in File N283: where that message type starts. These are all filled out and should not be changed unless there is a message structure change and the message was moved in File N283:

N275:401 – Message Template #1 Start Word in N283: (Default value is ‘10’.)
N275:402 – Message Template #2 Start Word in N283: (Default value is ‘30’.)
N275:403 – Message Template #3 Start Word in N283: (Default value is ‘60’.)
N275:404 – Message Template #4 Start Word in N283: (Default value is ‘90’.)
N275:405 – Message Template #5 Start Word in N283: (Default value is ‘120’.)
N275:406 – Message Template #6 Start Word in N283: (Default value is ‘150’.)
N275:407 – Message Template #7 Start Word in N283: (Default value is ‘180’.)
N275:408 – Message Template #8 Start Word in N283: (Default value is ‘210’.)
N275:409 – Message Template #9 Start Word in N283: (Default value is ‘230’.)
N275:410 – Message Template #10 Start Word in N283: (Default value is ‘260’.)
N275:411 – Message Template #11 Start Word in N283: (Default value is ‘280’.)
N275:412 – Message Template #12 Start Word in N283: (Default value is ‘0’.)
N275:413 – Message Template #13 Start Word in N283: (Default value is ‘0’.)
N275:414 – Message Template #14 Start Word in N283: (Default value is ‘0’.)
N275:415 – Message Template #15 Start Word in N283: (Default value is ‘0’.)
N275:416 – Message Template #16 Start Word in N283: (Default value is ‘0’.)
N275:417 – Message Template #17 Start Word in N283: (Default value is ‘0’.)
N275:418 – Message Template #18 Start Word in N283: (Default value is ‘0’.)
N275:419 – Message Template #19 Start Word in N283: (Default value is ‘0’.)
N275:420 – Message Template #20 Start Word in N283: (Default value is ‘0’.)
N275:421 – Message Template #21 Start Word in N283: (Default value is ‘0’.)
N275:422 – Message Template #22 Start Word in N283: (Default value is ‘0’.)
N275:423 – Message Template #23 Start Word in N283: (Default value is ‘0’.)
N275:424 – Message Template #24 Start Word in N283: (Default value is ‘0’.)
N275:425 – Message Template #25 Start Word in N283: (Default value is ‘0’.)
N275:426 – Message Template #26 Start Word in N283: (Default value is ‘0’.)
N275:427 – Message Template #27 Start Word in N283: (Default value is ‘0’.)
N275:428 – Message Template #28 Start Word in N283: (Default value is ‘0’.)
N275:429 – Message Template #29 Start Word in N283: (Default value is ‘0’.)
N275:430 – Message Template #30 Start Word in N283: (Default value is ‘0’.)
N275:431 – Message Template #31 Start Word in N283: (Default value is ‘0’.)
N275:432 – Message Template #32 Start Word in N283: (Default value is ‘0’.)
5 Input Templates

Input Templates are for configuring a new message being read in through the DB or RB modules or for DeviceNet Readers. These Input Templates are in File N287:. Word N287:2 holds the number of Templates that are configured. All Input Templates are the same lengths. Word N287:3 holds the length of the Templates. The length of each Input Templates is 20 words. Word N287:4 holds the last word used for Input Templates. And word N287:5 is a length storage. At word N287:10 the first Input Template starts. A list of the default Input Templates that are configured is as follows:

5.1 Input Template BCD Conversion

- The Input Template converts ASCII to BCD numbers.
- The type of Template is put into word 0
- The Msg Length is put into word 1. This length is the length that the DB or RB puts in the front of each message to the PLC. This represents the length in bytes.
- The Validation character is entered into word 2. This validation character is a unique character that is always present in the message to verify the integrity of the message.
- The Validation Characters location in the message is entered into word 3. This location is the position of the validation characters word in relation to the first word.
- The Validation characters location in the word is entered into word 4. A 0 is entered if the validation character is located in the low byte of the word and a 1 is entered if the validation character is in the high byte of the word.
- Word 5 is spare.
- The byte to start the BCD conversion is entered in word 6. A 0 is entered if the conversion is to start in the low byte or a 1 is entered if the conversion is to start in the high byte.
- The word location to start the BCD conversion is entered into word 7. This number represents the word position where the BCD conversion is to start in relation to the first word of the message.
- The length of the BCD conversion is entered into word 8. This number is the length in words that need to be converted.
- Word 9 is spare.
- In word 10 a 0 is entered if the message contains no decodes for the Template to convert. A 1 is entered if the message contains decodes.
- The location of the decodes is entered in word 11. This number represents the position of the decodes to convert in relation to the first word.
- The length of the decodes is entered in word 12. This number represents the number of words the decodes take up.
- The starting byte of the decodes is entered in word 13. This number is a 0 if the decodes start in the low byte and a 1 if the decodes start in the high byte.
- Word 14 is spare.
- Word 15 is spare.
- The File number for the output of the conversion routine is entered in word 16. This file number is where the conversion routine will put the converted information.
- The word number for the output of the conversion routine is entered in word 17. This word is where the conversion routine will start at to put the converted information.
- Word 18 is spare.
- Word 19 is spare.
5.1.1 Type 1 – Body Label Conversion

**Type 1 Input Template**
- N287:10 – Type of Template
- N287:11 – Msg Length
- N287:12 – Validation Character
- N287:13 – Validation Character location in Msg
- N287:14 – Validation Character located in the Hi/Low Byte 0 = Low, 1 = Hi byte
- N287:15 – Spare
- N287:16 – Conversion Input Hi/Low Byte to start at 0 = Low, 1 = Hi byte
- N287:17 – Conversion Input Location to start at
- N287:18 – Conversion Input Length
- N287:19 – Spare
- N287:20 – Conversion Input Decodes Present 0 = no, 1 = yes
- N287:21 – Conversion Input Decodes location
- N287:22 – Conversion Input Decodes Length
- N287:23 – Conversion Input Decodes Hi/Low Byte 0 = Low, 1 = Hi
- N287:24 – Spare
- N287:25 – Spare
- N287:26 – Conversion Output Destination File #
- N287:27 – Conversion Output Destination Word #
- N287:28 – Spare
- N287:29 – Spare

5.1.2 Type 2 – VIN Conversion

**Type 2 Input Template**
- N287:30 – Type of Template
- N287:31 – Msg Length
- N287:32 – Validation Character
- N287:33 – Validation Character location in Msg
- N287:34 – Validation Character located in the Hi/Low Byte 0 = Low, 1 = Hi byte
- N287:35 – Spare
- N287:36 – Conversion Input Hi/Low Byte to start at 0 = Low, 1 = Hi byte
- N287:37 – Conversion Input Location to start at
- N287:38 – Conversion Input Length
- N287:39 – Spare
- N287:40 – Conversion Input Decodes Present 0 = no, 1 = yes
- N287:41 – Conversion Input Decodes location
- N287:42 – Conversion Input Decodes Length
- N287:43 – Conversion Input Decodes Hi/Low Byte 0 = Low, 1 = Hi
- N287:44 – Character to Copy Located in the Hi/Low Byte 0 = Low, 1 = Hi
- N287:45 – Character to Copy Location
- N287:46 – Conversion Output Destination File #
- N287:47 – Conversion Output Destination Word #
- N287:48 – Spare
- N287:49 – Spare
5.1.3 Type 3 – Direct Copy

**Type 3 Input Template**
N287:50 – Type of Template
N287:51 – Msg Length
N287:52 – Validation Character
N287:53 – Validation Character location in Msg
N287:54 – Validation Character located in the Hi/Low Byte 0 = Low, 1 = Hi byte
N287:55 – Spare
N287:56 – Conversion Input Hi/Low Byte to start at 0 = Low, 1 = Hi byte
N287:57 – Conversion Input Location to start at
N287:58 – Conversion Input Length
N287:59 – Spare
N287:60- Spare
N287:61- Spare
N287:62- Spare
N287:63- Spare
N287:64- Spare
N287:65- Spare
N287:66- Conversion Output Destination File #
N287:67- Conversion Output Destination Word #
N287:68- Spare
N287:69- Spare