# Revision History

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<th>Description</th>
<th>Author</th>
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<td>06-03-16</td>
<td>1.0</td>
<td>Initial version.</td>
<td>BBM team</td>
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<td>Defect 338501</td>
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<td>• Figure 4 Corrected driver name</td>
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<td>• Updated Figure 8 with new checksums</td>
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<td>• Changed steps 9 and 10 to include save steps</td>
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<td>• Removed step 12</td>
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<td>• Appendix A: Reordered alphabetically by Instrument Test Code</td>
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<td>06-28-16</td>
<td>2.0</td>
<td>Updated Footer to include the Electronic Document Control System.</td>
<td>BBM team</td>
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<td>Moved Footer notes to Header, Updated Document to Version to 2.0</td>
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| 08-19-16 | 3.0      | Defect 352802:                                                                                                                                       • Updated section **Testing Template Setup** to describe selection of only one crossmatch template  
• Updated section **User ID Setup** to accommodate users with short user IDs  
• Updated names and checksums of configuration files in section 4  
• Added section 4.3 with instructions on how to remove test code mapping for Screening Cell 3 for instrument side configuration  
• Added section 4.8 with instructions on how to remove test code mapping for Screening Cell 3 for VBECS side configuration  
• Updated appendices A and B with new test codes for IAT only crossmatch  
• Updated appendix D with new template for IAT only crossmatch                                                                                                                                                                                                 | BBM team     |
| 09-07-16 | 4.0      | Defect 355473:                                                                                                                                       • Added warning about discrepancy in driver versions in sections 4.2 and 4.7  
• Added information about proper configuration of test Specimen UIDs to Test Group Two warning flag section  
• Removed information about Event Log from Test Group One and replaced it with checking Audit Trail Report  
Set Up Automated Instrument, Testing Template Setup section: Added informational message that refers to AABB standards for crossmatch. (Defect 372140)                                                                                                                                                                                                 | BBM team     |
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Introduction

VBECS is a Blood Bank application that facilitates ongoing compliance with Food and Drug Administration (FDA) standards for medical devices and enhances the VA’s ability to produce high-quality blood products and services to veterans. The system follows blood bank standards, standards of national accrediting agencies, FDA regulations and VA policies.

VBECS 2.2.0 introduced a new interface for blood bank testing performed by blood bank instrumentation to VBECS. The implementation of the interface and its associated validation are described in this guide.

Unauthorized access or misuse of this system and/or its data is a federal crime. Use of all data must be in accordance with VA security and privacy policies.

The U.S. FDA classifies this software as a medical device. Unauthorized modifications will render this device an adulterated medical device under Section 501 of the Medical Device Amendments to the Federal Food, Drug, and Cosmetic Act. Acquiring and implementing this software through the Freedom of Information Act requires the implementer to assume total responsibility for the software and become a registered manufacturer of a medical device, subject to FDA regulations. Adding to or updating VBECS software without permission is prohibited.

Instructions in this Setup Guide must be followed for the interface to deliver information to VBECS. Local validation is required to confirm proper operation before use. Validation and verification is required to ensure connectivity to VBECS.

This guide is provided to assist you with the multi-faceted required setup of your local blood bank testing instrument(s), Data Innovations Instrument Manager (DI IM) and VBECS to electronically transmit instrument test results to VBECS for use in the transfusion service.

There are specific setup requirements to test and transmit those testing results to VBECS for review using DI IM (Figure 1).

Figure 1: Hardware and Interface Configuration
Your local testing instrument(s) communicates with DI IM via an instrument specific driver provided by DI that must be downloaded from DI and installed locally.

DI IM communicates directly with VBECS via a generic HL7 interface driver that must be downloaded from DI and installed, locally. This driver is customized for VBECS by downloading and installing the driver configuration file.

VBECS has an interface that must be configured in VBECS Administrator to receive messages from DI IM (Figure 2).

**Figure 2: Setup Path**

<table>
<thead>
<tr>
<th>Overall Setup Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBECS</td>
</tr>
<tr>
<td><img src="image" alt="Setup Path Diagram" /></td>
</tr>
</tbody>
</table>

### Related Manuals and Reference Materials

- *Data Innovations Instrument Manager Manual*
- *Blood Bank Analyzer user’s guide (Instrument Manual)*

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Set up Automated Instrument

1 Network Connectivity Setup

In order to ensure a proper functioning of an interface between an Automated Instrument and Instrument Manager, the Instrument needs to be connected to the VA network. The static IP Address and Port number has to be assigned to the Instrument (further referred in this document as \(<\text{Instrument IP}\>\) and \(<\text{Instrument Port}\>\)). Please refer to the Instrument Manual or contact your vendor for the instructions about how to perform this setup. Check with Local IT staff to establish the connection to Instrument Manager.

2 Testing Template Setup

If testing templates are not configured properly it will be impossible for instrument results to be accepted in VBECS.

Please refer to Appendix D: Testing Templates for the list of instrument templates. These test templates must be set up on your Instrument before any results can be sent to VBECS. Always use them for results that are sent to VBECS. Any results sent that do not follow the above templates will be rejected. Please refer to the Instrument Manual or contact your vendor for the instructions about how to perform template setup.

Please note that Appendix D: Testing Templates contains definition of two Crossmatch templates:

- VBECS Crossmatch.pln – template for blood banks that perform IS and IAT crossmatch together
- VBECS Crossmatch IAT.pln – template for blood banks that perform IAT only crossmatch (no Immediate Spin)

These two templates are mutually exclusive so please select only one that is appropriate for your site.

AABB Standards require a serological XM to detect ABO incompatibility (5.16.1) and a local policy must be in place if the site is not performing an IS AHG as part of their serologic crossmatch test, manual or using an instrument.

3 User ID Setup

Failure to set up proper user IDs on an instrument will prevent instrument results from being accepted in VBECS.

In order for VBECS to properly recognize the person who performed testing on an Instrument, all users accessing the instrument must have their user IDs set up to match their network user IDs (e.g., VHAISHBURNSK).
Due to the constraints of the ProVue messaging system, only 10 characters of the user name can be transferred with test results to VBECS. To ensure the uniqueness of all user names, please strip the front characters of network user ID to ensure that it is no longer than 10 characters long. For user IDs that are already 10 characters or shorter you can use full user ID in ProVue. For example:

<table>
<thead>
<tr>
<th>Length of User ID</th>
<th>Example of User ID</th>
<th>ProVue ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>VHASFCYOUNGS</td>
<td>SFCYOUNGS</td>
</tr>
<tr>
<td>11</td>
<td>VHASFCTRANK</td>
<td>HASFCTRANK</td>
</tr>
<tr>
<td>10 or less</td>
<td>VHASFCTSTU</td>
<td>VHASFCTSTU</td>
</tr>
</tbody>
</table>

Please refer to the Instrument Manual or contact your vendor for the instructions about how to perform setup of user IDs.
Set Up Instrument Manager

1 Instrument Manager version

Please verify that you are using Instrument Manager Version 8.13 or greater (Figure 3). In Instrument Manager navigate to Help -> About Instrument Manager.

Figure 3: Instrument Manager Version Screen

If your version of Instrument Manager is older than 8.13 please STOP executing this guide and update the software first. Do not proceed until the issue is resolved.

If your Instrument Manager is greater than 8.13 you may proceed. The user must execute the instructions and validate functionality on newer version. Discrepancies in the instructions must be reported as a CA-SDM ticket. See Appendix E.

2 Instrument Manager to Automated Instrument Connectivity

Please contact your local network administrative staff and ensure that your local network allows two-way TCP/IP connectivity between <Instrument Manager IP> address and <Instrument IP> address on <Instrument Port>.

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3 Installing Instrument Driver

Two drivers are required for the correct operation of the Automated Instrument interface to VBECS (Figure 4).

**Figure 4: Required Drivers**

<table>
<thead>
<tr>
<th>Driver</th>
<th>Name</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diamed Diana</td>
<td>diadiani</td>
<td>8.00.0009</td>
<td>Instrument to DI IM driver</td>
</tr>
<tr>
<td>Data Innovations LLC, Configurable HL7</td>
<td>diihl7ml</td>
<td>8.00.0044</td>
<td>DI IM to VBECS (HL7) driver</td>
</tr>
</tbody>
</table>

*Please refer to the user’s manual for Instrument Manager or contact Data Innovations for the instructions on how to install drivers for Instrument Manager.*

After successful installation of drivers, please go to **Report -> Available Drivers** menu option in Instrument Manager and verify that the drivers listed in Figure 4 are present.

4 Set Up Instrument Manager Configuration

*Execute instructions in this section for each instrument that will be connecting to VBECS.*

*Modifying rules or test code mappings as imported using this Instrument Manager configuration Setup Guide may lead to malfunction of the Automated Instrument to VBECS interface.*

Prerequisites for the Instrument Manager Configuration files download:

- You must be an administrator on `<Instrument Manager Server>`.
- Once the above prerequisite is met you may proceed.

4.1 Download instrument configuration files

*Use local procedures for copying the instrument configuration files to the Instrument Manager server.*
1. Navigate to http://vaww.oed.portal.va.gov/projects/vbecs/Pages/Instrument-Manager-Configuration-Files-Release.aspx (Figure 5).

**Figure 5: Connecting to the VBECS Share**

![Connecting to the VBECS Share](image1)

2. To download a file from the SharePoint, right-click on it and select **Save target as** (Figure 6).

**Figure 6: Example of Save target as...**

![Save target as...](image2)

3. In the next screen, specify the directory to save (Figure 7).

**Figure 7: Example of Save As**

![Save As](image3)

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4. Save both the ProVue – HL7 Interface Configuration Template for VBECS 08172016.gsb and the ProVue – Instrument Interface Configuration Template for VBECS 08172016.gsb files to the C:temp directory.

5. Per local procedures copy both files to C:temp on the Instrument Manager server

6. On the Instrument Manager server; Click Start, and in the “Search programs and files” box type Run and hit enter. Type PowerShell and click OK to launch PowerShell

7. Copy and paste or type the following commands to generate checksums for configuration files:

```
certutil –hashfile “C:\Temp\ProVue – HL7 Interface Configuration Template for VBECS 08172016.gsb” MD5  <press Enter>
certutil –hashfile “C:\Temp\ProVue – Instrument Interface Configuration Template for VBECS 08172016.gsb” MD5  <press Enter>
```

To copy, highlight the lines in grey and enter CTRL-C.

To insert the copied line into a PowerShell window, right click in the PowerShell window and select “Paste”.

8. Verify that checksums for both files match those shown in Figure 8.

**Figure 8: Instrument Manager Configuration File checksums**

![Image of PowerShell console showing checksums]

STOP If the checksums do not match, stop and file a national CA SDM ticket to coordinate assistance with installation using the template in Appendix E. Do not proceed until the issue is resolved.


### 4.2 Import Instrument side configuration

1. After downloading and verifying configuration files, open Instrument Manager and navigate to Configuration -> Configuration Editor.
2. Click on the **Import** button (Figure 9).

**Figure 9: Example of Configuration Editor**

![Configuration Editor](image)

3. Once the import screen opens, click the **Browse** button and select **C:\Temp** folder (Figure 10).

4. Click OK.

**Figure 10: Example of Configuration Import Screen**

![Configuration Import Screen](image)
5. Select **ProVue – Instrument Interface Configuration Template for VBECS 08172016.gsb** file from the list.

6. Enter **Configuration Name** that contains 3 letter location code of the instrument (e.g., **HIN** for Hines VAMC), word **ProVue** and sequence number (1 for the first instrument, 2 for the second etc.). Example Configuration Name for instrument configuration located at Hines would be:

```
HIN_ProVue_1
```

This configuration name will be further referred in this document as `<Instrument Side Configuration>`.

7. Enter **Configuration Description** and click **Import** button. Verify that the following confirmation window displays (Figure 11).

**Figure 11: Example of Successful Configuration Import**

![Restored Driver Configuration]

<table>
<thead>
<tr>
<th>OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Restored: 2/22/2016 12:34:28 PM</td>
</tr>
</tbody>
</table>

*If you are using newer version of the driver than the one mentioned in section 3, the Instrument Manager will warn you about the discrepancy in driver versions. Please acknowledge this warning and continue.*

8. Click **OK** and close the **Restore Driver Configuration** window.

9. Verify that **Configuration Editor** shows the new configuration on the list (Figure 12).
10. **Close** the Configuration Editor Window

**4.3 Modify test code mapping for instrument side configuration (only for sites that perform 2 Cell Antibody Screen)**

> Execute instructions in this section only if you perform Antibody Screen with 2 Screening Cells instead of 3.

1. In Instrument Manager navigate to **Configuration -> Configuration Editor**.
2. Click on the **Properties** button (Figure 13)
3. On the **Configuration Properties** window click on **Test Code Map** (Figure 14)

**Figure 14: Example of Configuration Properties Window**

4. Using the dropdown in the upper left corner of the **Test Code Mapping** window select test code ^VBECS ABS.pln^3 (SC3) and click **Delete** button (Figure 15)

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5. Click **Yes** to confirm deletion

6. Using the dropdown in the upper left corner of the Test Code Mapping window select test code `^VBECS TAS.pln^11 (SC3)` and click **Delete** button (Figure 16)

![Figure 16: Example of deletion of SC3 test code for Type and Screen](image)

7. Click **Yes** to confirm deletion

8. Click **Close** on Test Code Mapping window

9. Click **Close** on Configuration Properties window

10. Click **Close** on Configuration Editor
4.4 Verify test code mapping for instrument side configuration

1. Navigate to Reports -> Configuration Options and Mappings.
2. Select the `<Instrument Side Configuration Name>` from the pull down menu (Figure 17)
3. Select the Results Test Code Mapping Tab (Figure 17: Example of Results Test Code Mapping Tab).

Figure 17: Example of Results Test Code Mapping Tab

**STOP** If mismatches in Test Codes names, missing or extra Test Codes are encountered, file a national CA SDM ticket to coordinate assistance with installation using the template in Appendix E. Do not proceed until the issue is resolved.

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5. Close **Configuration Options and Mappings** window.

### 4.5 Verify rules

1. Next navigate to **Reports -> Configuration Options and Mappings**.
2. Select the `<Instrument Side Configuration Name>` from the drop-down in the upper left corner. (Figure 14).
3. Select the **Rules Tab** (Figure 18).
4. Verify the Rules Tab matches all rules listed in **Appendix C: Rules**.

**Figure 18: Example of Rules Tab**

![Example of Rules Tab](image)

5. Close the **Configuration Options and Mappings** window.
If mismatches in rules are encountered, **file a national CA SDM ticket to coordinate assistance with installation using the template in Appendix E. Do not proceed until the issue is resolved.**
4.6 Configure rules

In this section you will establish the name of the instrument associated with test results for VBECS reports. If you are setting up multiple instruments, make sure that each has a unique name.

1. Navigate to Configuration -> Specimen Management Configuration -> Rules Processing.
2. Select <Instrument Side Configuration Name> from the pull down menu (Figure 15).
3. Locate rule SetInstrumentID.
4. Click on the Then line in the rule.
5. Modify the rule by typing <Instrument Name> between the quotation marks as shown in the lower box (Figure 19).
6. Locate rule `SetReceivingFacility`. Click on **Then** line in the rule. Modify the rule by typing the `<Division Code>` between the quotation marks as shown (Figure 20).

<Division Code> also known as Station Number in Vista is a unique alphanumeric code that is associated with each hospital (e.g. 589 for VA Heartland West VAMC). This code must match the division code configured in **VBECS Administrator** application for a given site.

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7. After the change was made, both rules' text should be displayed in red color on the screen.

8. Click on Save Test / In Validation Rule Set button located in the toolbar above the rules (Figure 21).

Figure 21: Example of Save Rules Button

9. Verify that the message is received (Figure 22).

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10. Click on the **Save Live Rule Set** button (Figure 23) located in the toolbar and click **Yes** to confirm.

**Figure 23: Example of Save Rules in Live Set Button**

11. Expand the **Live Rule Set**, and verify that rule text matches **Appendix C: Rules** and includes changes made to **SetInstrumentID** and **SetReceivingFacility** (Figure 24).
Figure 24: Example of Live Rules Set View

![Example of Live Rules Set View](image)

STOP If differences in rules are encountered, file a national CA SDM ticket to coordinate assistance with installation using the template in Appendix E. Do not proceed until the issue is resolved.

12. Close the Rule Setup window, returning to the main menu.

4.7 Import VBECS (HL7) side configuration

STOP Only one VBECS side configuration is needed even if you use multiple ProVue instruments. All ProVues will share the same configuration.

Only one VBECS side configuration is needed even if you use multiple ProVue instruments. All ProVues will share the same configuration.

STOP Modifying rules or test code mappings in the Instrument Manager configuration outside of this Setup Guide is not allowed and may lead to malfunction of the Automated Instrument to VBECS interface.

1. Navigate to Configuration -> Configuration Editor (Figure 25).
2. Click on the Import button.
3. Once the **Restore Driver Configuration** window opens, click the **Browse** button and select `C:\Temp` folder (Figure 26).

4. Select **ProVue – HL7 Interface Configuration Template for VBECS 08172016.gsb** file from the list.

5. Enter a **Configuration Name** that contains 3 letter location code of the instrument (e.g. **HIN** for Hines VAMC), word **VBECS** and sequence number (1 for the first configuration, 2 for the second etc.). Example Configuration Name for VBECS side configuration located at Hines would be:

   **HIN_VBECS_1**

This configuration name will be further referred in this document as **<HL7 Side Configuration>**.

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6. Enter **Configuration Description** and click **Import** button. Verify that the following confirmation window (Figure 27) displays.

**Figure 27: Example of Successful Configuration Import**

*If you are using newer version of the driver than the one mentioned in section 3, the Instrument Manager will warn you about the discrepancy in driver versions. Please acknowledge this warning and continue.*
7. Click **OK** and close the **Restore Driver Configuration** window.

8. Verify that **Configuration Editor** shows the new configuration on the list (Figure 28).

**Figure 28: Example of Newly Imported HL7 Configuration**

![Configuration Editor](image)

### 4.8 Modify test code mapping for VBECS side configuration (only for sites that perform 2 Cell Antibody Screen)

Execute instructions in this section only if you perform Antibody Screen with 2 Screening Cells instead of 3.

1. Select configuration imported in previous section and click on the **Properties** button (Figure 29)
2. On the **Configuration Properties** window click on **Test Code Map** (Figure 30)

![Figure 30: Example of Configuration Properties Window](image)

3. Using the dropdown in the upper left corner of the **Test Code Mapping** window select test code `^VBECS ABS.pln^3 (SC3)` and click **Delete** button (Figure 31)
4. Click Yes to confirm deletion

5. Using the dropdown in the upper left corner of the Test Code Mapping window select test code ^VBEC^VBECS TAS.pln^11 (SC3) and click Delete button (Figure 32)

Figure 32: Example of deletion of SC3 test code for Type and Screen

6. Click Yes to confirm deletion

7. Click Close on Test Code Mapping window

8. Click Close on Configuration Properties window

9. Click Close on Configuration Editor

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4.9 Verify test code mapping for VBECS side configuration

1. Navigate to Reports ->Configuration Options and Mappings.
2. Select the `<HL7 Side Configuration Name>` from the drop-down in the upper left corner (Figure 25).
3. Select the Results Test Code Mapping Tab (Figure 33).
4. Verify that the Results Test Code Mapping Tab matches all rules listed in Appendix B: HL7 (VBECS) Side Mapping.

Figure 33: Example of HL7 Configuration Report Window

5. Close Configuration Options and Mappings window.
If mismatches in Test Codes names, missing or extra Test Codes are encountered, file a national CA SDM ticket to coordinate assistance with installation of the automated interface associated with VBECS 2.2.0 using template in Appendix E. Do not proceed until the issue is resolved.
5 Set Up HL7 Connection to VBECS TEST

**STOP** Modifying rules or test code mappings as imported using this Instrument Manager configuration Setup Guide may lead to malfunction of the Automated Instrument to VBECS interface.

1. Navigate to **Configuration -> Connection Assignment**.
2. On the **Connection Assignment** window click **Add** button.
3. Select **Configuration Name <HL7 Side Configuration>** (Figure 34).
4. Enter the **Connection Name** that matches the **<HL7 Side Configuration>** and word **Connection**. For example:

   HIN_VBECS_1_Connection

5. Check **Include in Specimen Management** check box (Figure 34).
6. Select **TCP/IP connection** in Device (Figure 34).
Figure 34: Example of Connection Properties Window

7. Click on **Device Parameters** button.

8. Enter **TCP/IP Address** and **TCP/IP Port Number** that matches **VBECS TEST Application IP Address and IP Port Number** configured in **VBECS TEST Administrator** application for **Auto Instrument Interface** (Figure 35). (Please refer to **VistA Blood Establishment Computer Software (VBECS) 2.2.0 Technical Manual Security Guide** for instruction on how to configure interfaces for VBECS.)

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9. Close the **TCP/IP Port Configuration** window and click **Yes** to save.

10. Close the **Connection Properties** window and click **Yes** to save.

11. Verify that the newly created connection shows on the **Connection Assignment** window (Figure 36).

**Figure 36: Example of Newly Created Connection**
6  Set Up Instrument Connection

- Execute instructions in this section for each instrument that will be connecting to VBECS.
- Modifying connection settings in the Instrument Manager outside of this Setup Guide is not allowed and may lead to malfunction of the Automated Instrument to VBECS interface.

1. On the **Connection Assignment** window, click **Add** button.
2. On the **Connection Properties** window, enter the **Connection Name**. Enter a name that contains `<Instrument Side Configuration>` and word **Connection**. For example:

   **HIN_ProVue_1_Connection**

3. Select `<Instrument Side Configuration>` as **Configuration Name**.
4. Check **Include in Specimen Management** check box.
5. Select **TCP/IP connection**.
6. On the **Destination Lines** list, check the box next to connection configured in previous section (Figure 37).
7. Click on **Device Parameters** button.

8. Enter **TCP/IP Address** and **TCP/IP Port Number** that matches `<Instrument IP>` and `<Instrument Port>` discussed in Section **Network Connectivity Setup**.

9. Uncheck **Send String When Opening Connection** check box (Figure 38).

---

**Figure 37: Example of Connection Properties Window**

![Connection Properties Window]

**Figure 38: Example of TCP/IP Configuration Window**

![TCP/IP Configuration Window]
10. Click close on the TCP/IP Port Configuration window and click Yes to save.
11. Click close on the Connection Properties window and click Yes to save.
12. Verify the newly created connection shows on Connection Assignment window (Figure 39).
13. Close the Connection Assignment window.

**Figure 39: Example of Newly Created Connection**

![Connection Assignment Window](image)

### 7 Test New Connections

1. Navigate to System -> Status.
2. Right-click on each newly created connection and choose option to **Start Selected Connections** (Figure 40).

**Figure 40: Example of Connection Status Window**

![Status Display](image)

3. Verify that all newly created connections are showing Status of On after about a minute or so. (Figure 41).

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Figure 41: Example of Successful Connection Test

If one or more connections fail to start, file a national CA SDM ticket to coordinate assistance with installation of the automated interface associated with VBECS 2.2.0 using template in Appendix E. Do not proceed until the issue is resolved.

4. Close the Status Display.

8 Validate Instrument connectivity to VBECS TEST

Execute validation instructions from Appendix F to verify that Instrument is properly interfacing with VBECS.

If one or more validation scenarios fail, file a national CA SDM ticket to coordinate assistance with installation of the automated interface associated with VBECS 2.2.0 using template in Appendix E. Do not proceed until the issue is resolved.

9 Set up HL7 Connection to VBECS PROD

1. Navigate to System -> Status.

2. Right-click <VBECS_Connection> and choose option to Stop Selected Connections (Figure 42).

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3. Wait until connection status changes to Off. Navigate to Configuration -> Connection Assignment.
4. Select <VBECS_Connection> and click Properties (Figure 43).

5. On Connection Properties window click Device Parameters (Figure 44).
6. Enter **TCP/IP Address** and **TCP/IP Port Number** that matches **VBECs PROD Application IP Address and IP Port Number** configured in **VBECs PROD Administrator** application for **Auto Instrument Interface** (Figure 45). Please refer to **Vista Blood Establishment Computer Software (VBECs) Technical Manual Security Guide** for instruction on how to configure interfaces for VBECs.
7. Close the **TCP/IP Port Configuration** and click **Yes** to confirm changes.

8. Close the **Connection Properties window** and click **Yes** to confirm changes.

9. Close the **Connection Assignment** window.

10. Navigate to **System -> Status**.

11. Right-click `<VBECS_Connection>` and choose option to **Start Selected Connections** (Figure 46).

---

**Figure 46: Example of Connection Status Window**

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12. Verify that `<VBECS_Connection>` is showing Status of **On** after about a minute or so. (Figure 47).

**Figure 47: Example of Successful Connection Test**

If connection fails to start, **file a national CA SDM ticket to coordinate assistance with installation using template in Appendix E. Do not proceed until the issue is resolved.**

13. Close the **Status Display** and Log Off the system.
# Glossary

<table>
<thead>
<tr>
<th>Acronym, Term</th>
<th>Definition</th>
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<tr>
<td>Automated Instrument</td>
<td>Blood Bank Analyzer that performs blood testing.</td>
</tr>
<tr>
<td>Division Code</td>
<td>Also known as Station Number in Vista is the unique alphanumeric code that is associated with each hospital (e.g. 589 for VA Heartland West).</td>
</tr>
<tr>
<td>Instrument Manager (IM)</td>
<td>Software created by Data Innovations that serves as a middleware between Automated Instrument and VBECS. It translates messages containing test results sent from an instrument into HL7 messages that are then parsed into VBECS.</td>
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<tr>
<td>VA</td>
<td>Department of Veterans Affairs.</td>
</tr>
<tr>
<td>VBECS</td>
<td>VistA Blood Establishment Computer Software.</td>
</tr>
<tr>
<td>VistA</td>
<td>Veterans Health Information Systems and Technology Architecture. VistA software, developed by the VA, is used to support clinical and administrative functions at VA Medical Centers nationwide. VistA is composed of packages that undergo a verification process to ensure conformity with name spacing and other VistA standards and conventions.</td>
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### Appendix A: Instrument Side Mapping

Table 1: Instrument Side Mapping

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* test codes marked in yellow will not be present for sites that perform 2 Cell Antibody Screen
## Appendix B: HL7 (VBECS) Side Mapping

### Table 2: HL7 (VBECS) Side Mapping

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* test codes marked in **yellow** will not be present for sites that perform 2 Cell Antibody Screen
Appendix C: Rules

Figure 48: Rules

--- Test / In Validation - Incoming result - Before Message Queued Internally ---

Rule # 1
Desc - Set Test Name for XM
If - {Test Code} {On Any Test} {Contains} "Crossmatch"
Then - {Set} {Test Code Sub ID} {On That Test} = "XM"

Rule # 2
Desc - Set Test Name for TAS
Child of Rule # 1 - Else
If - {Test Code} {On Any Test} {Contains} "TAS"
Then - {Set} {Test Code Sub ID} {On That Test} = "TAS"

Rule # 3
Desc - Set Test Name for DAT
Child of Rule # 2 - Else
If - {Test Code} {On Any Test} {Contains} "DAT"
Then - {Set} {Test Code Sub ID} {On That Test} = "DAT"

Rule # 4
Desc - Set Test Name for Patient ABORh
Child of Rule # 3 - Else
If - {Test Code} {On Any Test} {Contains} "ABDRev"
Then - {Set} {Test Code Sub ID} {On That Test} = "Patient ABORh"

Rule # 5
Desc - Set Test Name for ABS
Child of Rule # 4 - Else
If - {Test Code} {On Any Test} {Contains} "ABS"
Then - {Set} {Test Code Sub ID} {On That Test} = "ABS"

Rule # 6
Desc - Set Test Name for Unit ABORh
Child of Rule # 5 - Else
If - {Test Code} {On Any Test} {Contains} "Confirm"
Then - {Set} {Test Code Sub ID} {On That Test} = "Unit ABORh"

Rule # 7
Desc - Set Test Name for Antigen Typing
Child of Rule # 6 - Else
If - {Test Code} {On Any Test} {Contains} "Phenotype"
Then - {Set} {Test Code Sub ID} {On That Test} = "Antigen Typing"

Rule # 8
Desc - ZeroTestResult
If - {Result} {On Any Test} = "-"
Then - {Set} {Result} {On That Test} = "0"

Rule # 9
Desc - SetInstrumentID
If - {Always}
Then - {Set} {Instrument ID} = ""

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Rule # 10
Desc - SetReceivingFacility
If - {Always}
Then - {Set} {Receiving Facility} = ""

Rule # 11
Desc - MZeroTestResult
If - {Result} {On Any Test} = "M-
Then - {Set} {Result} {On That Test} = "0"

Rule # 12
Desc - MOneTestResult
If - {Result} {On Any Test} = "M1+
Then - {Set} {Result} {On That Test} = "1+

Rule # 13
Desc - MTwoTestResult
If - {Result} {On Any Test} = "M2+
Then - {Set} {Result} {On That Test} = "2+

Rule # 14
Desc - MThreeTestResult
If - {Result} {On Any Test} = "M3+
Then - {Set} {Result} {On That Test} = "3+

Rule # 15
Desc - MFourTestResult
If - {Result} {On Any Test} = "M4+
Then - {Set} {Result} {On That Test} = "4+"
Appendix D: Testing Templates

Table 3: Testing Templates

<table>
<thead>
<tr>
<th>Template Name</th>
<th>Selected Fields</th>
<th>VBECS Test</th>
<th>Test Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBECS ABDRev.pln</td>
<td>A, B, A1 Cell, B Cell, D</td>
<td>Patient ABO/Rh</td>
<td>Anti-A, Anti-B, A1 Cells, B Cells, Anti-D, D Control, ABO Interp, Rh Interp, Comments</td>
</tr>
<tr>
<td>VBECS ABS.pln</td>
<td>Cell1, Cell2, Cell3, AbScr</td>
<td>Antibody Screen</td>
<td>Screening Cells1, Screening Cells2, Screening Cells3, ABS Interp, Comments</td>
</tr>
<tr>
<td>VBECS TAS.pln</td>
<td>A, B, A1 Cell, B Cell, D</td>
<td>Type and Screen</td>
<td>Anti-A, Anti-B, A1 Cells, B Cells, Anti-D, D Control, ABO Interp, Rh Interp, Screening Cells1, Screening Cells2, Screening Cells3, ABS Interp, Comments</td>
</tr>
<tr>
<td>VBECS DAT.pln</td>
<td>IgGC3, DAT, Remarks</td>
<td>DAT</td>
<td>AHG, DAT Interp, Comment</td>
</tr>
<tr>
<td>VBECS DAT IgG.pln</td>
<td>IgG, DAT IgG, Remarks</td>
<td>DAT IgG</td>
<td>IgG, DAT IgG Interp, Comment</td>
</tr>
<tr>
<td>VBECS Crossmatch IAT.pln**</td>
<td>XIAT, XM IAT, Remarks</td>
<td>Crossmatch</td>
<td>AHG, XM Interp, Comments</td>
</tr>
<tr>
<td>VBECS Crossmatch.pln**</td>
<td>XIS, XIAT, XM IS, XM IAT</td>
<td>Crossmatch</td>
<td>IS, AHG, IS Interp, AHG Interp, Comments</td>
</tr>
<tr>
<td>VBECS Confirm.pln</td>
<td>A, B, AB, D, Fwd Gr, Rh</td>
<td>Unit ABO/Rh Confirmation</td>
<td>Anti-A, Anti-B, Anti-A,B, Anti-D, ABO Interp, Rh Interp, Comments</td>
</tr>
<tr>
<td>Template Name</td>
<td>Selected Fields</td>
<td>VBECS Test</td>
<td>Test Component</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------</td>
<td>-----------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>VBECS Phenotype.pln</td>
<td>D Phen* C E K</td>
<td>Patient and Unit Antigen Typing</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>sm c sm e Ctl Phen* Rh Phen* Remarks</td>
<td>Anti-C Anti-E Anti-K Anti-c Anti-e</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Test results not used in VBECS. They are on the template to allow users to print them if necessary.

** VBECS Crossmatch IAT.pln and VBECS Crossmatch.pln are mutually exclusive. Please setup only one that is appropriate for your site.
Appendix E: CA SDM Support Ticket Template

Please use the following to complete your ticket:

- **Incident area:** NTL.APP.HealtheVet VistA.VBECS 2_0
- **Summary:** VBECS 2.2.0 Automated Instrument configuration assistance request
- **Description:**
  - Enter contact information for the main blood bank and the name of the responsible individual(s) for all communications.
  - Enter preferred date and time.
- **Property Questions:** Respond NO to the required questions.
- **Group:** automatically fills in correctly do not change it from. *NTL Alert Blood Bank & VBECS*
- **Add additional information as required.**
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Appendix F: Validation Planning and Example Test Scenarios

The following is a flowchart to help assess any one change and plan accordingly.

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These are examples of test scenarios. Each site is responsible for evaluating changes for their intended use, assess risk, and for establishing additional validation test scenarios.

All test scenarios have a suggested user role, this may require adjustment to align with the patient or unit data selected to execute the scenario. Process any overrides as well, based on patient or unit selection.

*The Expected Outcome numbering corresponds to the Step number where the change verification appears.

## Test Group One: AI interface disabled

**Test Objective:** Demonstrate that the system will reject test results sent from automated instrument if the Automated Instrument interface is disabled.

**Option:** VBECS Administrator, Automated Instrument Interface

### Data

- Before beginning, verify current configuration, activity, and status of the existing interfaces, VistALink, and CPRS in your test account.
- Make sure that the VBECS-OERR HL7 link in VistA is NOT shutdown.
- 1. Create RBC and TAS orders in CPRS and accept them in VBECS.

### User

- VBECS Administrator access is required to configure the AUTOMATED TESTING interface.
- No specific user role is required to process TAS and RBC orders in VBECS.

### Steps

1. Log into VBECS Administrator:
2. Disable the AUTOMATED TESTING interface using Configure Interfaces option.
3. A message appears (You are about to disable Auto Instrument Interface. It will cause VBECS to stop sending and receiving messages via that interface. Continue?), Click Yes.
4. Close the window as all fields are disabled.
5. Perform TAS test on the instrument and send results of testing to VBECS.

### Expected Outcome

5. Verify that after sending test results from an instrument fails it is possible to complete TAS test using manual testing grids and subsequently issue and transfuse blood unit to a patient.

### Reports:

6. Review the Audit Trail report for changes to the interface.
Test Group Two: Verify AI individual test(s)

Test Objective: Demonstrate that the system will allow the selected user role to perform normal workflow activities using your local blood bank testing instrument.

Note: Validate all tests that are performed at your site using an automated instrument.

Prior to initiating any testing of the automated instrument interface, see the VistA Blood Establishment Computer Software (VBECS) 2.2.0 Technical Manual-Security Guide for instructions for configuring your local instrument and Data Innovations Instrument Manager.

Configure your Test UID to clearly differentiate from a Production UID during your validation, for example, production is 1234567890, with 123 being your consistent prefix, change 123 or 12 to TS or TST or 999. Please change the Numeric Identifier for the Blood Bank Accession Area in your site Test Account.

Enable Automated Instrument Interface in VBECS Admin if it was disabled while performing testing in Test Group One.

Verify your VBECS processes with the Automated Instrument interface.

Your local test plan will demonstrate that the system will perform normal daily work per your local policies, procedures and local validation plan that may include:

Blood Units: Automated Instrument or via the short cut key

- ABO-Rh confirmation
- Unit Antigen Typing or Repeat

Patients: Automated Instrument or via the short cut key

- Perform a Type and Screen test (ABS and ABS with Auto-control only)
- Perform crossmatch tests: Serologic (*Selected in Blood Units: Select Units before testing.*)
- Patient Tests:
  - ABO/Rh or Repeat
  - Antibody Screen or Repeat
  - Direct Antiglobulin Test or Repeat
  - Antigen Typing or Repeat
- Overrides, (ABO/Rh Discrepancy, Crossmatch incompatible: Give with Medical Director Approval)
- Report data from these actions is available for retrieval.
  - Testing Worklist Report
  - Patient History Report
  - Unit History Report
  - Exception Report (ABO/Rh Discrepancy, Give with Medical Director Approval)

*Remember to click NO to proceeding to the serologic crossmatch when selecting units for automated instrument testing.
## Test Group 2 Scenario 1: Verify AI TAS test

**Note:** the Type and Screen (TAS) is a combination of two tests and may be saved as individual tests without completing the TAS as a whole.

| Data                  | VBECS: Select a patient.  
| CPRS: Place a Type and Screen (TAS) order for the patient  
| LAB: Access the order  
| VBECS: Accept the order, (Orders, Accept Orders) |
| User                  | No specific user role is required to process TAS order in VBECS. |
| Steps                 | 1. User checks the Patient testing list to make sure the order is accepted in VBECS and appears on the Pending Task List (PTL). (Patient, Patient Testing, Diagnostic Tests).  
|                        | 2. Close the PTL.  
|                        | 3. Process the specimen on the instrument using the recommended TAS template for that instrument. Complete all work needed to transmit the information to VBECS.  
|                        | 4. Select Patients, Automated Instrument to review TAS results.  
|                        | 5. Select the specimen UID, scanning the UID is preferred.  
|                        | 6. Review TAS test results.  
|                        | 7. Accept only the ABS or ABO/Rh test. Close the window.  
|                        | 8. Open the PTL.  
|                        | 9. Try to select TAS on PTL and complete testing on it manually.  
|                        | 10. Open the Automated instrument window and accept the second part of TAS.  
|                        | 11. Close the automated instrument window.  
|                        | 12. Check Reports |
| Expected Outcome       | 5. Verify that the specimen UID is selectable by scanning, entry or patient selection  
|                        | 6. Verify that the correct test results appear on the Automated Instrument review list.  
|                        | 8. Verify that the TAS appears on the PTL with a status of “Instrument Results Pending Review”.  
|                        | 9. Verify that system prevents user from completing TAS since they are still pending results from an instrument for it.  
|                        | 12. Verify that the results and comments appear as expected on the reports:  
|                        | • Testing Worklist Report  
|                        | • Patient History Report  
|                        | • Exception Report |
### Test Group 2 Scenario 2: Verify AI serologic crossmatch test

| Data | VBECS: Select a patient.  
CPRS: Place a Type and Screen (TAS) order and Red Blood Cell order for the patient  
LAB: Accession the orders  
VBECS: Accept the order. (Orders, Accept Orders)  
Process the TAS to completion.  
Select a blood unit for a selected patient*:  
- Previously entered into the division’s inventory (Blood Units, Incoming Shipment)  
- ABO compatible  
- May be available or selected for another patient (available, selected, crossmatched) status.  
- May or may not trigger selection overrides  
*Remember to click NO to proceeding to the serologic crossmatch when selecting units for automated instrument testing. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>No specific user role is required to process crossmatch test in VBECS.</td>
</tr>
</tbody>
</table>
| Steps | 1. Process the component unit’s specimen on the instrument using the recommended template for that instrument. Complete all work needed to transmit the information to VBECS.  
2. Select Patients, Automated Instrument to review crossmatch results.  
3. Select the specimen UID, scanning the UID is preferred.  
4. Review results, select compatibility and accept crossmatch result.  
5. Print or do not print tag as desired.  
6. Accept the test and close the automated instrument window.  
7. Check Reports. |
| Expected Outcome | 4. Verify that crossmatch results sent from an instrument show correctly on the screen.  
7. Verify that the results and comments appear as expected on the reports:  
- Testing Worklist Report  
- Patient History Report (interpretations only).  
- Exception Report |
### Test Group 2 Scenario 3: Verify AI patient diagnostic tests
(ABO/Rh, Antibody Screen, Direct Antiglobulin Test, Patient Antigen Typing, and the reflex test)

<table>
<thead>
<tr>
<th>Data</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBECS: Select a patient.</td>
<td>No specific user role is required to process diagnostic tests in VBECS.</td>
</tr>
<tr>
<td>CPRS: Place a diagnostic test order for the patient</td>
<td></td>
</tr>
<tr>
<td>LAB: Accession the order</td>
<td></td>
</tr>
<tr>
<td>VBECS: Accept the order. (Orders, Accept Orders)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. User checks the Patient testing list to make sure the order is accepted in VBECS and appears on the Pending Task List (PTL). (Patients, Patient Testing, Diagnostic Tests).</td>
</tr>
<tr>
<td>2. Close the PTL.</td>
</tr>
<tr>
<td>3. Process the specimen on the instrument using the recommended testing template for that instrument. Complete all work needed to transmit the information to VBECS.</td>
</tr>
<tr>
<td>4. Select Patients, Automated Instrument to review test results.</td>
</tr>
<tr>
<td>5. Select the specimen UID, scanning the UID is preferred.</td>
</tr>
<tr>
<td>6. Review and accept test results</td>
</tr>
<tr>
<td>7. Close the automated instrument window.</td>
</tr>
<tr>
<td>8. Check reports.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expected Outcome</th>
<th>5. Verify that the specimen UID is selectable by scanning, entry or patient selection.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6. Verify that patient test results sent from an instrument show correctly on the screen.</td>
</tr>
<tr>
<td></td>
<td>8. Verify that the results and comments appear as expected on the reports:</td>
</tr>
<tr>
<td></td>
<td>• Testing Worklist Report</td>
</tr>
<tr>
<td></td>
<td>• Patient History Report</td>
</tr>
<tr>
<td></td>
<td>• Exception Report</td>
</tr>
</tbody>
</table>

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### Test Group 2 Scenario 4: Verify AI blood unit tests

<table>
<thead>
<tr>
<th>Data</th>
<th>VBECS: Select a blood unit previously entered into the division’s inventory (Blood Units, Incoming Shipment). For ABO/Rh Confirmation testing on the instrument, unit should be in a Limited status. For Unit Antigen Typing, the unit may or may not have been confirmed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>No specific user role is required to process blood unit tests in VBECS.</td>
</tr>
</tbody>
</table>
| Steps | 1. Process the component unit’s specimen on the instrument using the recommended template for that instrument. Complete all work needed to transmit the information to VBECS.  
2. Select Blood Units, Automated Instrument to review test results.  
3. Select the blood component unit’s Donor Identification Number (DIN), scanning the DIN is preferred.  
4. Select the product code (if there are multiple blood units with the same product code)  
5. Review the transmitted blood unit test.  
6. Accept the test and close the automated instrument window.  
7. Check Reports |
| Expected Outcome | 5. Verify that blood unit test results show correctly on the screen.  
7. Verify that the results and comments appear as expected on the reports:  
  - Testing Worklist Report  
  - Unit History Report (interpretations only).  
  - Exception Report |