Doc Type	Tech Notes
Doc Id	TN146
Last Modified Date	02/13/2018

DAServer Hot Backup with InTouch HMI Software and IndustrialSQLServer Historian

LEGACY TECH NOTE #

486

SUMMARY

This *Tech Note* explains particular InTouch Redundancy scenarios, and includes InSQL 9.0.

SITUATION

Application Versions

- InTouch HMI Software 9.5 and later
- IndustrialSQL Server Historian 9.0 and later
- DASSI Direct

Scenario

This scenario uses the following Nodes:

- **DEMO01**
- **DEMO02**
- **InSQLPC**

DASSIDIRECT is installed on DEMO01 and DEMO02

InTouch 9.5 SP1 is installed on DEMO01 and DEMO02

InSql 9.0 is installed on InSQLPC

The application communicates on 2 different network layers: a PC network and a PLC Network.

The goal to be reached is the following:

DASSIDIRECT on **DEMO01** is the main data acquisition server. In case of a communication failure such as PC failure, DAS failure, network failure on **DEMO01**, we need to have a secondary source active **DEMO02**.

When **DEMO01** come back to normal situation, the system must revert to the original configuration in which **DEMO01** is the main data acquisition server.

Application Notes

- InTouch Enable Secondary source is not able to detect a PLC connection failure, it only check the status of the DaServer. In the case that the network cable (PLC-to-InTouch PC) is not connected for any reason, InTouch Secondary Source doesn't switch to the secondary source. InSql 9.0 has the same behavior.
- The following scripts and the configurations InTouch 9.5 and InSQL 9.0 are provided to allow switching the communication when the PLC network is disconnected. All the others cases (PC switched off, DaServer deactivated and PC network disconnected) are handled by InTouch/ InSQL functionality.

InTouch Redundancy

Configuring the Primary Server: DEMO01

The following section describes the necessary Access Names and Scripts on the Primary Server.

Configuring the Access Names

1. Configure the Access Names on the Primary Server as shown in Figure 1 (below).

- **Access Name: S7**
- **Enable Secondary Source: Enabled**

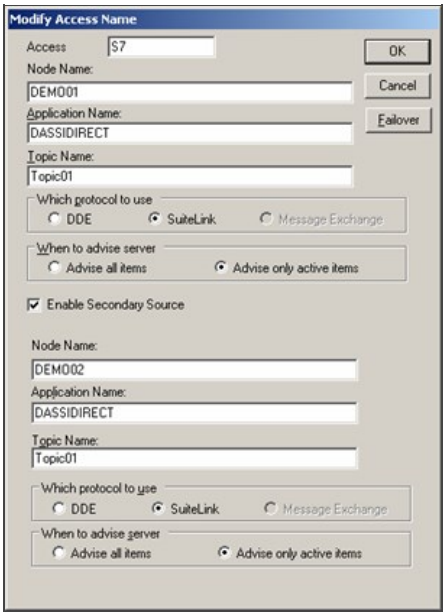

Figure 1: Configure Access Name

2. Click **OK**. The **Failover Configuration** dialog box appears (Figure 2 below).

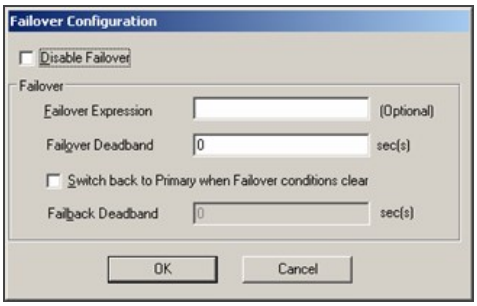

Figure 2: Configure Failover

3. Leave the defaults and click **OK**.
4. Configure another access name as shown in Figure 3 (below).

- **Access Name: S7Local**
- **Enable Secondary Source: NOT enabled**

Figure 3: Configure Second Access Name

5. Click **OK**.

Configuring the Source Application Script

This InTouch runtime script evaluates whether the Primary or Secondary source is active.

1. Configure the Application Script with the following settings:

- **Condition Type: While Running**
- **Every: 2000 Msec**

  Source = IOGetactiveSourceName("S7");

2. Click **Validate** and define **Source** as a memory Message tag.

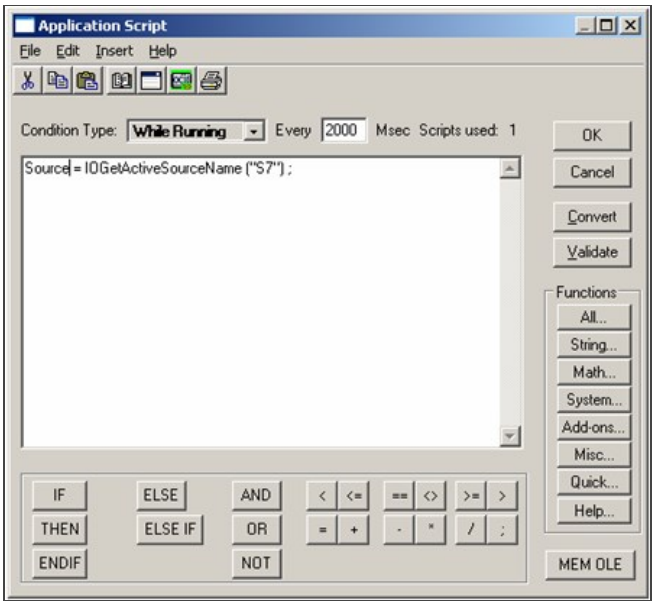

Figure 4: Application Script Example

Configuring the PLC_CommStatus Condition Script

The **PLC_CommStatus** script allows forcing the failover in the case the PLC network (PLC-to-DEMO01 PC) cable has been disconnected.

1. Configure the Condition with the following settings:

- **Condition: PLC_CommStatus**
- **Condition Type: On False**

  IOForcefailover ("S7");

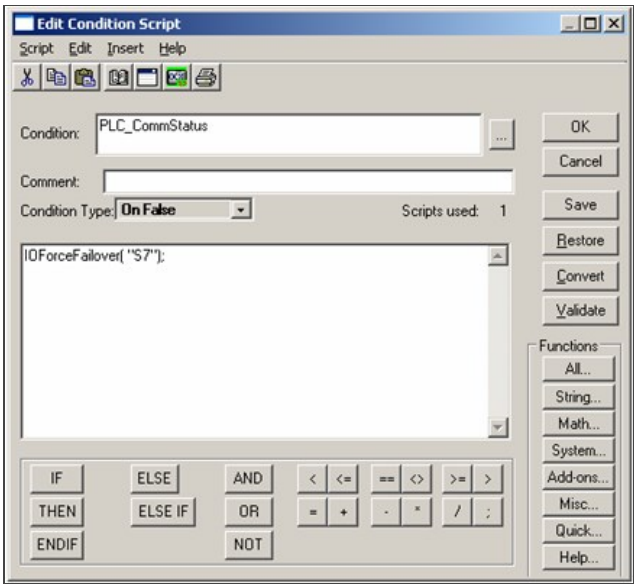

Figure 5: PLC_CommStatus Condition Script Configuration

2. Click Validate and configure PLC_CommStatus as an IO Discrete tag with the settings shown in Figure 6 (below):

- **Access Name: S7**
- **Item Name: SYSSTATUS** (0 = bad communication, 1= good communication)

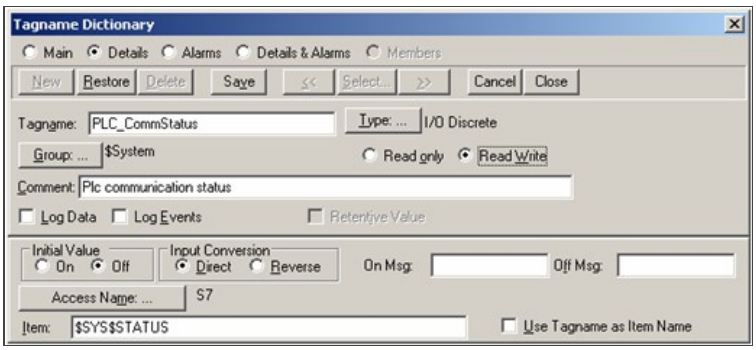

Figure 6: PLC_CommStatus Tag Definition

Note: SYSSTATUS is a predefined specific item inside the DAServers. If the application uses an IOServer the item called **Status** must be used.

Configuring the Demo01...CommStatus Condition Script

The following script restores the initial condition when communication is active on DEMO01. It forces the failback to the primary source when the secondary source is active and the communication with DAServer installed on **DEMO01** is resumed.

1. Configure this condition script with the following settings:

- **Condition: Demo01_PLC_CommStatus == 1 AND Source == "Secondary"**
- **Condition Type: On True**

IOForceFailover ("S7");

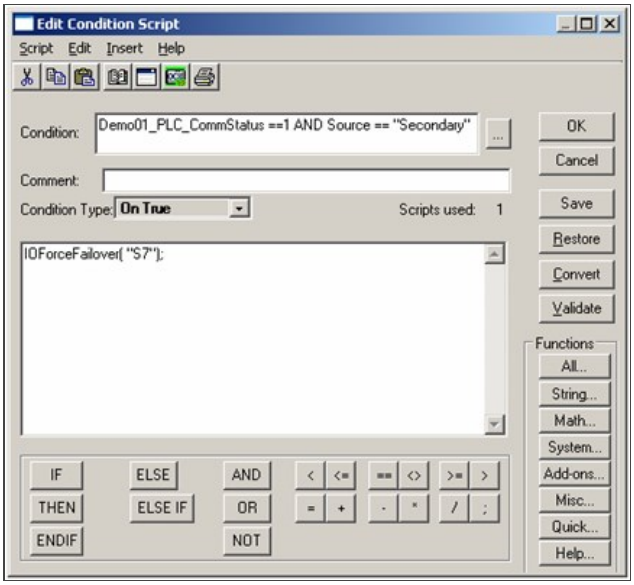

Figure 7: Demo-to-PLC Comm Status Script Configuration

2. Define **Demo01_PLC_CommStatus** as an IO Discrete tag configured with the settings shown in Figure 8 (below).

- **Access name: S7Local**
- **Item Name: SYSSTATUS**

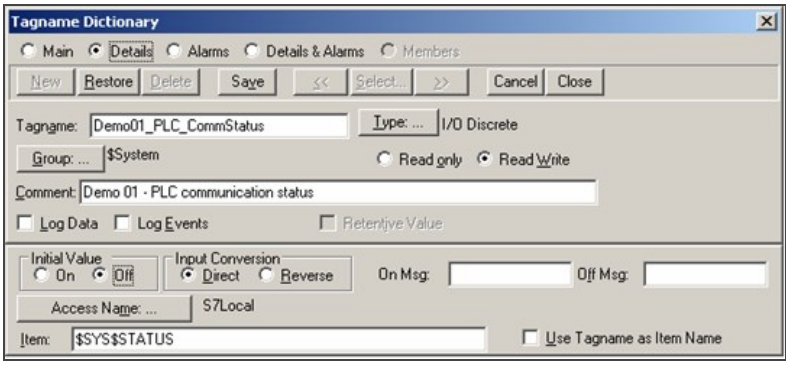

Figure 8: Demo01_PLC_CommStatus Tag Definition

The script is executed only in the case that the communication with PC DEMO01 is recovered and the active source for the access name **S7** is secondary (the secondary DaServer is active on PC Demo02).

Configuring the Secondary Server: PC DEMO02

The following section describes the necessary Access Names and Scripts on the Secondary Server.

Configuring the Access Names

1. Configure the Access Names on the Secondary Server as shown in Figure 9 (below).

- **Access Name: S7**
- **Secondary source: Enabled**

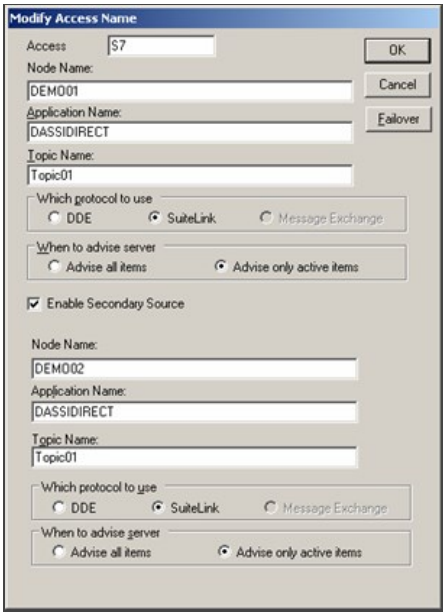

Figure 9: Access Name with Secondary Source

2. Click **OK** and leave the default settings as shown in Figure 10 (below).

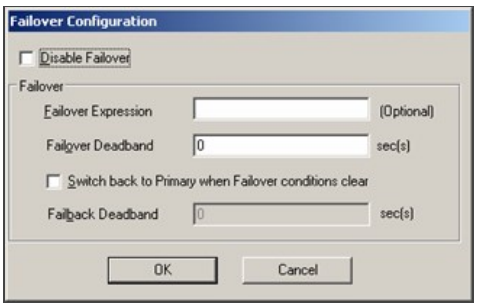

Figure 10: Failover Configuration Default Settings

3. Click **OK**.

4. Configure another Access Name for a remote tag reference pointing to the InTouch running on PC DEMO01 (Figure 11 below).

Figure 11: Demo01 Access Name Configuration

Configuring the Application Script

This Application script functions the same way as on PC Demo01. It checks for communication from both nodes in runtime. In case of problems on the PLC-to-PC connection, the secondary DAServer is activated.

1. Configure the Application Script with the following settings:

- **Condition Type: While Running**
- **Every: 2000 Msec**

Source = IOGetactiveSourceName("S7");

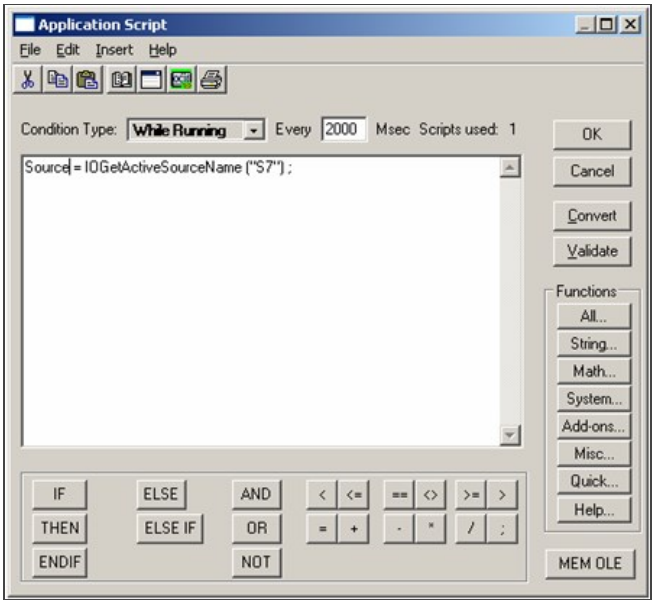

Figure 12: Application Script Configuration

2. Click **Validate** and define Source as a **Memory Message** tag.

Configuring the PLC_CommStatus Condition Script

This script checks for communication between the PLC and the PC.

1. Configure the **PLC_CommStatus** Condition Script with the settings shown in Figure 13 (below).

- **Condition: On False**

IOForceFailover("S7");

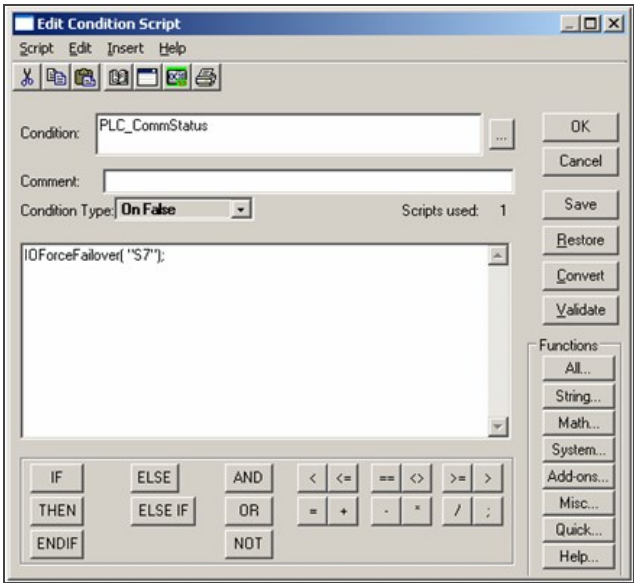

Figure 13: PLC_CommStatus Condition Script Configuration

2. Click **Validate** and define **PLC_Status** as an IO Discrete Tag with the following settings:

- **Access Name: S7**
- **Item Name: sysstatus** (0 = bad communication, 1= good communication)

Configuring the Demo01...Condition Script

This InTouch script forces the failback on the primary source if the secondary source is active. It then restores the initial condition (communication active on DEMO01) when possible.

1. Configure the **Demo01...Condition Script** as shown in Figure 14 below.

- **Condition: demo01:Demo01_PLC_CommStatus == 1 AND Source == "Secondary"**
- **Condition Type: While True**
- **Every: 3000 Msec**

```
IF Rem$Second.Quality == 192 THEN
IOForceFailover( "S7");
ENDIF;
```

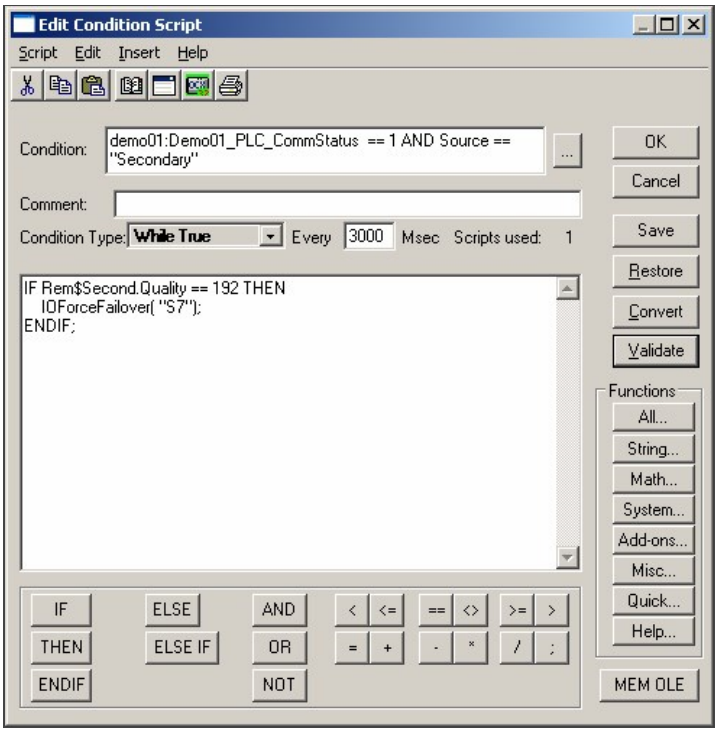

Figure 14: Demo01...Condition Script Configuration

2. Click **Validate** and define **Rem$Second** as an I/O Integer type tag. This tag checks the communication status with InTouch running on Demo01 by monitoring the .quality field. In this case, if .quality = 192, it means that InTouch on DEMO01 is running and the network is connected.
3. Configure the tag as shown in Figure 15 (below).

- **Access Name: Demo01**
- **Item Name: $Second**

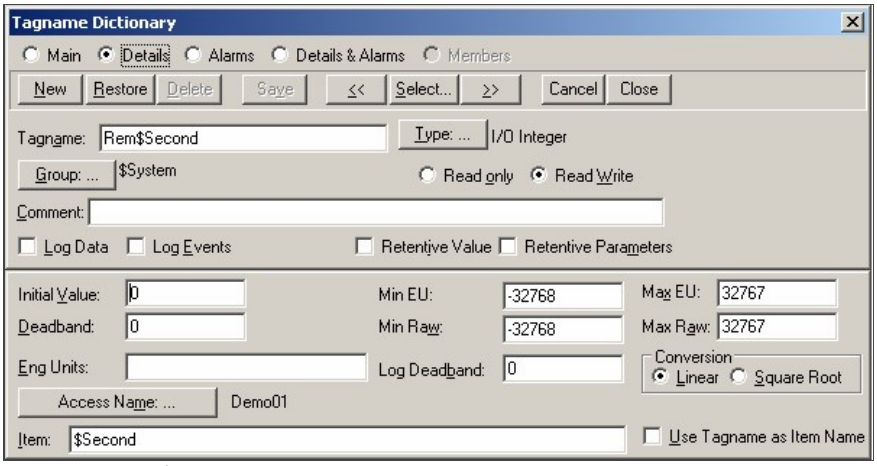

Figure 15: Rem$Second Definition

Note: This scenario allows having only one DAServer active at time.

IndustrialSQL Server Historian 9.0

You can configure IndustrialSQL Server Historian to switch I/O Sources in the case of network PC-to-PLC connection failures. In this example, InSQL collects data from InTouch on PC DEMO01 during normal conditions, and an ALTERNATE IO Server configuration points to the InTouch running on PC DEMO02.

Note: For more information on Alternate Server settings, see the InSQL User Guide.

Configure the InSQL **View Properties** as shown in the following figure (Figure 16 below).

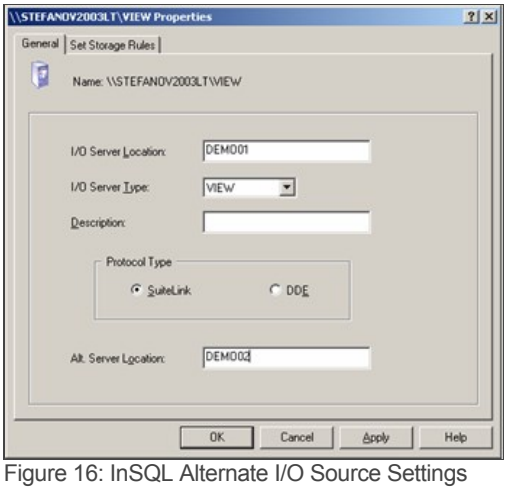

Figure 16: InSQL Alternate I/O Source Settings

InSQL recieves data from the InTouch running on PC DEMO01. All possible failure scenarios are covered by the InTouch scripts configured in the previous section. If InTouch on PC DEMO01 fails (PC is switched off, InTouch not running, network problems), the Alternate IO Server setting changes the data source to PC DEMO02.

The Fail Back to the InSQL primary source is handled by InSQL 9.0 automatically.

Note: You cannot specify a failover IDAS for a node that is enabled for Store-Forward. The features are mutually exclusive. Applications that require both Failover and Store-Forward functionality must use a redunant Industrial Application Server with RedundantDIObjects.

Other Scenarios

In some cases, your requirements must also include other scenarios. For example, IndustrialSQL Server can be switched off for server maintenance and you must preserve all incoming data.

Configure a Remote IDAS on another PC (for this example it is called **DEMO02**), import the tags to the main InSQL Server, and enable the **Store Forward** option on the remote IDAS node (Figure 17 below). The features can co-exist if no failover is required.

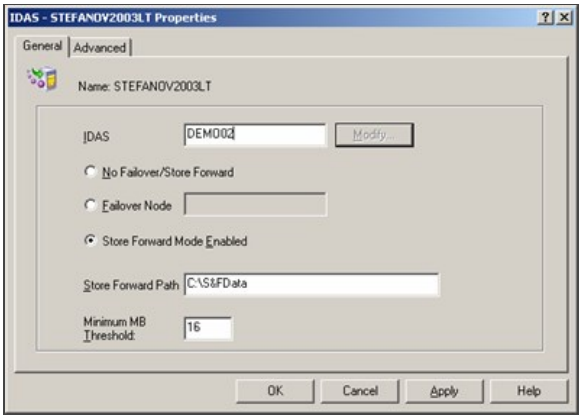

Figure 17: Remote IDAS and Store Forward Configuration