ProScada TagBridge IO Driver

Contents

1 Introduction to the Tagbridge IO driver

This driver is designed to form a bridge between 2 iFix systems that allows lower bandwidth & faster response times than iFix networking.

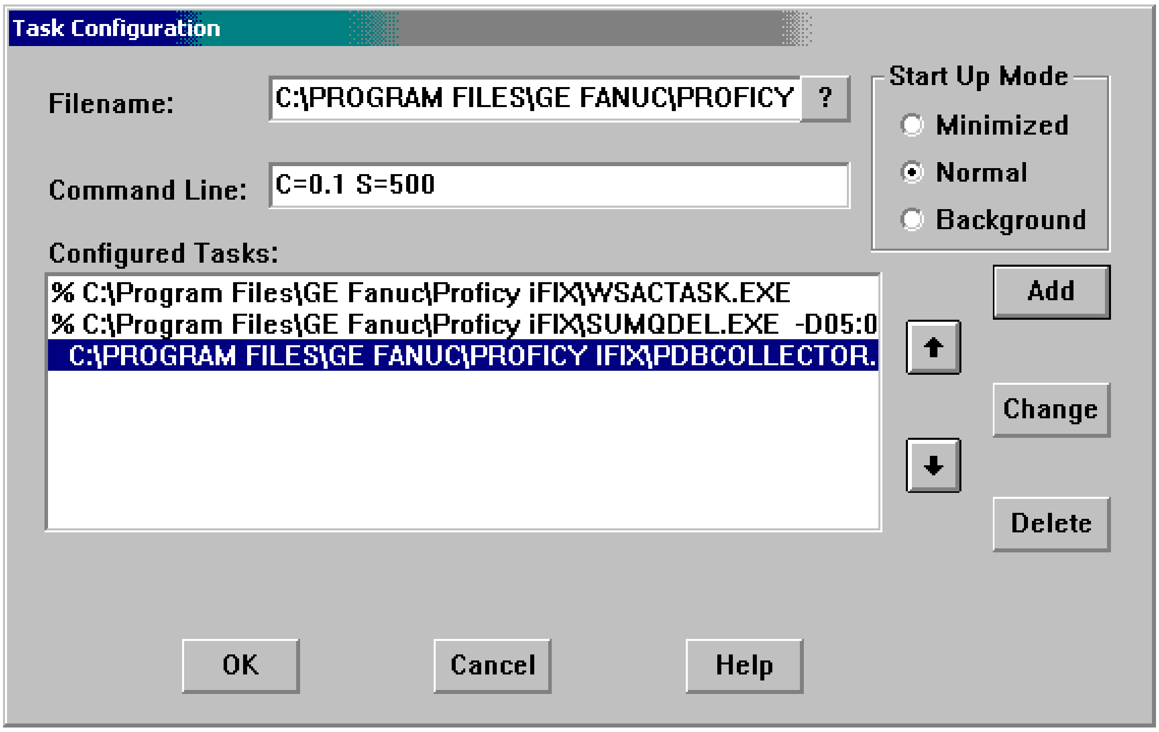
1.1 Server Installation (side that reads via iFix EDA Interface)

The application TGB_EDA_Collector.exe must run AFTER iFix starts up, note if it is running before, iFix will not start. The collector shuts down automatically when iFix shuts down.

The TGB_EDA_Collector has the following 4 command line parameters

- **C=1** The **C**hange by % (Delta), this is the % change that ALL tags must change before a report by exception update is made to the server. In this example it must change by 1%. *Note the % applies only to tags with Filed name .F_ and the % refers to the F_EHI-F_ELO fields (which need to be set correctly)
- **S=300** The Tag Scan rate is the rate tags are read from the Server / collector side
- **U=10** The Tag slow update rate, or the maximum time between tag updates in minutes
- **W=0** Disable writing through this interface

The recommended way of running the collector is from the iFix Task configurator as in the picture below. *note in the picture it is running "normal" startup this is for debugging purposes.



Task Configuration

Filename: C:\PROGRAM FILES\GE FANUC\PROFICY

Command Line: C=0.1 S=500

Start Up Mode

○ Minimized
● Normal
○ Background

Configured Tasks:

```
% C:\Program Files\GE Fanuc\Proficy iFIX\WSACTASK.EXE
% C:\Program Files\GE Fanuc\Proficy iFIX\SUMQDEL.EXE  -D05:0
  C:\PROGRAM FILES\GE FANUC\PROFICY IFIX\PDBCOLLECTOR.
```

Figure 1: Automatic startup of EDA collector

1.1.1 Collector Operation

The **S= <nnn>** Scan time sets the EDA Scan time AND the minimum message rate, so Higher values result in fewer but larger packets of data (more value changes per scan). However this is still more efficient.

The **C=** change threshold decreases the number of updates with noisy Analog values. To read digital value it may not be > 5 %

1.1.2 Debugging the Collector side

The Collector is a console mode program, at startup it shows some startup text and NOTHING else happens. If you want to see messages press any key to activate (un-pause) debug messages.

The following keys have meaning

“P/p” Pause the messages press again to show messages
“Q/q” Quit TGB collector
Any key shows a help message AND un-pauses the display of messages

2 Client Driver (TGB Driver receives data from TGB_EDA_Collector.exe)

2.1 Installation

1. Run the Setup.exe
2. You will be prompted for the location of the iFix directory (iin 8 character DOS~ mode)
3. Perform network setup ensuring that all server names exist. i.e. the Server names used in the tagname references must be ‘pingable’ from the client side

2.2 Network setup

The driver uses TCP/IP networking and establishes connection from the client to the server via UDP port 35000.

The “Node” names used in the tag addresses MUST resolve to the correct IP address by one of the following means

- Windows netbios
- DNS
- Host file

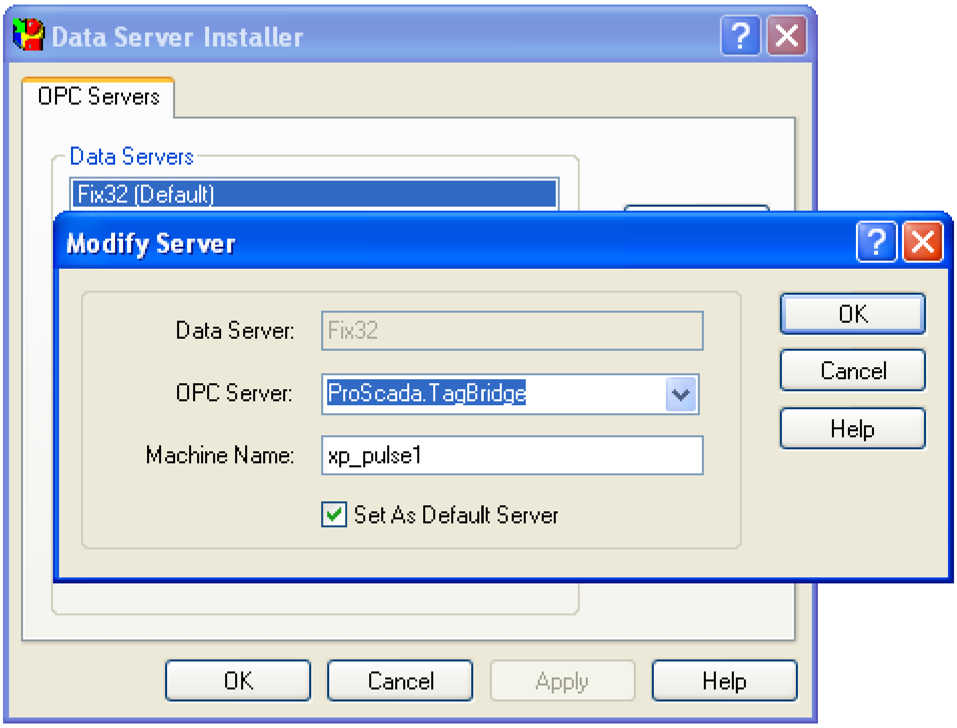
This simply means you must be able to “ping” the Collector machine, by that name

2.2.1 Host file method

1. open the file windows\system32\drivers\etc\hosts (no extension) with notepad.exe

2. you will see a line like "127.0.0.1 localhost"
3. Add a line x.x.x.x VM1 (the nodename I used in the example)
4. open a DOS box (command prompt) and type:
    a. PING VM1<enter> - do not bother testing until this works “VM1” is the machine where PDBCollector.exe is running

1 Configuring Proficy Pulse or iFix workstation via OPC



Data Server: Fix32

OPC Server: ProScada.TagBridge

Machine Name: xp_pulse1

☑ Set As Default Server

Figure 2 : changing FIX32 data server

1. Run the Pulse\tools\data server installer
   a. Run the Data Server Installer (in tools)
   b. Set the Fix32 data server to ProScada.Tagbridge
   c. *** by using the Fix32 data server name the existing pictures on the SCADA server should work i.e. the original iFix taglink names are the same with this OPC server.
2. Ping servers via server node name. Edit the hosts file to allow if not possible via machine name
3. Edit FilteredErrors.INI to avoid the comm errors on page open
   a. [ERRORCODES]
   b. Count = n
   c. Error2 = 0

3 Configuring the iFix database (only relevant for fix-fix database)

3.1 Tag IO address format in iFix

<remote node|backup node><':' or '.'><tagname>.<field>
or
< remote node|backup node ><':' or '.'><<tagname>.<any prefix>[n]
{this format is used for arrays of AR blocks}
or
< remote node|backup node >:STATUS.<anything>

1. Create an iFix tag AI,DI,AR,DR etc.
2. give it a tagname we recommend the same tagname as that on the collector side
3. set IO Device to "TGB" for the TGB driver type in the IO address
   a. < remote node|backup node >:<tagname>.<field>
   b. Always try to avoid having any differences in the nodenames used by the tags in the DB
   c. Note the "backup Node" is not required, however we do not recommend that you mix some with & some without in the same DB
   d. Note the "backup Node" is separated from the primary node with a "|" character
4. The HW Options field contains a number. This is the Access time setpoint in Seconds. The default is 60 seconds(if left blank). See optimizing the system

3.1.1 note on AR/DR block offsets

The driver supports arrays of AR/DR blocks, these MUST correspond to an AR/DR on the collector side so that

Note that any block that has a similar array scheme to the AR block will work

.Fieldname = .<any prefix>[number] gets translated to

.<any prefix>0, .<any prefix>1,.<any prefix>2.........<any prefix>number-1

for an AR block this is .F_[n] -> .F_0,.F_1,.F_2..............F_<n-1>

<tagname>.F_3 will correspond to <tagname>.F_3 on the collector side. Although you only have one tag configured in the databases on each side

4 Status tags

The stats tags are for the purpose of monitoring the performance of the system.
** the values are updated every 30 seconds and the many of the values indicate the statistics of the last 30 seconds

1. Create a "AR" with address <remote node>:STATUS.<anything> *note the ".<anything>" is compulsory I just type ".x"
2. Create a picture and add values with links to the AR tag with AR offsets ie. <tagname>.F_0 is the first value
3. The following values are available

.F_0	Total number of tags on collector subscribed to
.F_1	Updates per second (number of changed values / time)
.F_2	Tags Scanned per second (F_0 * number of scans / time)
.F_3	% compression (F_1/F_2)
.F_4	Writes per second
.F_5	Errors / second (EDA errors at Collector)
.F_6	Server lost packets
.F_7	Client lost packets
.F_8	KBytes per second
.F_9	Client connection in use (0=Using primary, 1=Backup) (This address is writeable)
.F_10	Other Client connection state (1=connection ok, this is the other connection NOT .F_9)

The Address .F_9 is writeable, allowing the SCADA client to manually select which of a pair of servers to use.

5 Optimising the system

The Access times and the type of blocks you choose have an important impact on performance.

1. Use AR & DR blocks wherever possible (you can have an AR block on the client side connecting to an AI block on Collector side)
2. Only tags that need to be alarmed in the background need to be AI/ or DI. So you can change any tag with alarms disabled to AR/DR
3. AR/DR blocks are only scanned when the picture is open
4. If a tag is not scanned for the Access time, the driver puts it **offscan**
    a. This means : The driver sends a message to the collector to STOP updating that tag
    b. The first time you display the page the value is ????? until the driver gets a new value which should be quick – this is normal behavior for iFix drivers

If you do NOT want the tags to go offscan, type "0" in hw options

6 Limitations

1. 8 nodes x 8000 tags each
2. As of V1.8 supports 4 Client per Collector
3. Each client can link to a redundant pair of servers

7 Notes on timers

The main internal status checking time is set to 30 seconds:

- The status update sends a status request like a “ping” to the TGB_<x>_Collector at this interval
- Status refresh is at this time
- Tags are only marked bad OR server changeover after 3x Status time == 90 seconds
- The TGB_<x>_Collector stops sending data & scanning EDA if no packets received for 3x Status time == 90 seconds

8 Notes on Server failure changeover behavior

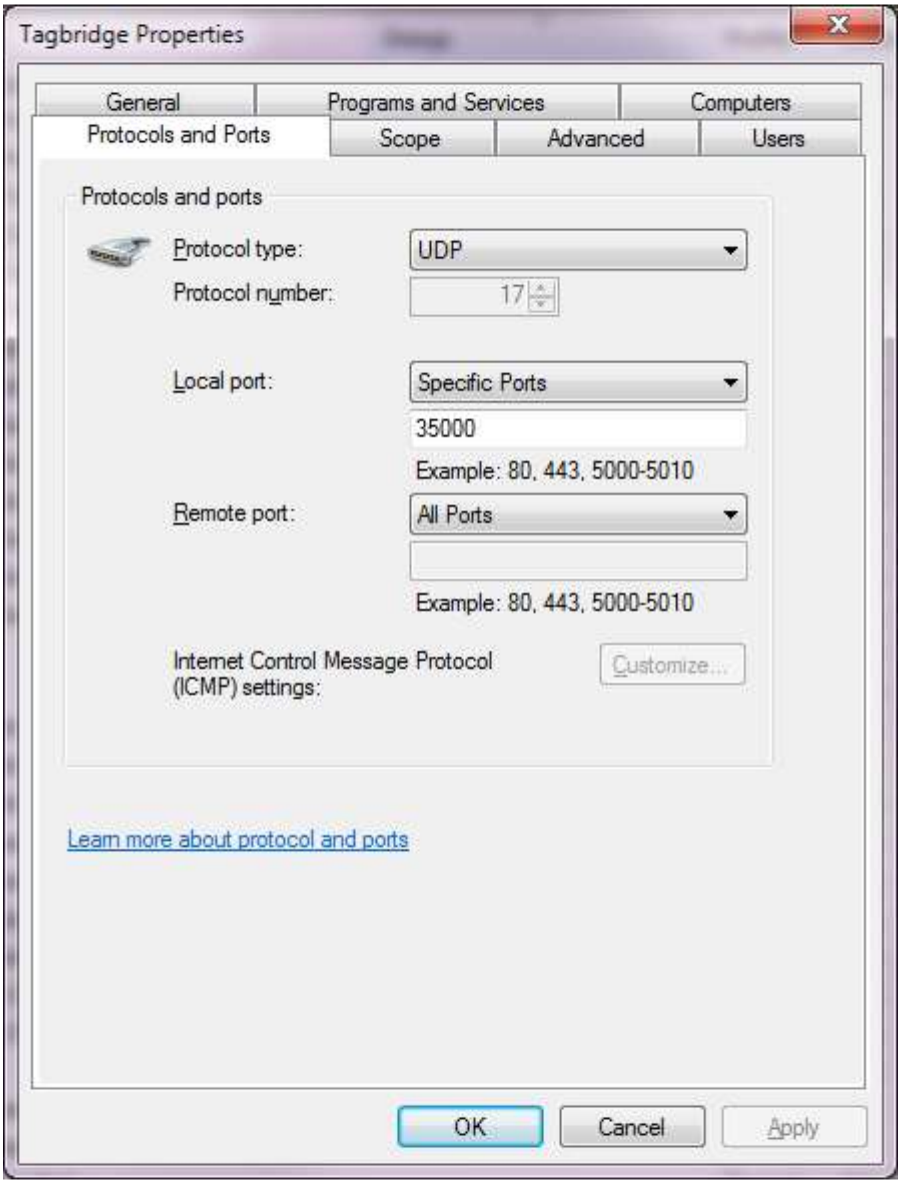
When the client stops receiving data, the values on screen FREEZE for 90 seconds, then the driver changes over to the backup server.

It will remain on the Backup server even if the primary server recovers (seen in .F_10) until the SCADA writes to “0” to STATUS.F_9

9 Configuring the windows firewall (server/collector side)

The Client side may need to be ‘enabled’ if windows prompts you for the application TGBSPOLL.EXE.

However the server side does need configuration, make an inbound rule for it as follows UDP port 35000



Tagbridge Properties

Protocols and ports

Protocol type: UDP

Protocol number: 17

Local port: Specific Ports

35000

Example: 80, 443, 5000-5010

Remote port: All Ports

Example: 80, 443, 5000-5010

Internet Control Message Protocol (ICMP) settings:

Figure 3 : Firewall setttings

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