PTAGIS

PIT Tag Information System
Columbia Basin

Newsletter

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A Fisheries Data Project of the Pacific States Marine Fisheries Commission

REMINDER:

2007 PIT-Tag Forecast Due

The PIT-Tag Forecast Request Letter for fiscal year 2007 was due on 28 September 2006. Project Sponsors and Managers for the Northwest Power and Conservation Council's Fish and Wildlife Program projects, funded by Bonneville Power Administration, that require PIT tags and have not submitted a Forecast Request Letter should do so as soon as possible.

The three-part carbon copy PIT-Tag Distribution Request Form (PDRF) will no longer be available or accepted. All transactions will be managed electronically. The fourth step of the Tag Distribution Process has been amended to include the details of this change.

Tag Distribution Process

There are five key steps to the process:

① FORECAST

The Project Sponsor provided PSMFC with a Forecast Request Letter detailing tag requirements for BPA fiscal year (typically this occurs once per year). This forecast is used to identify approved projects and to schedule deliveries from the manufacturer. The forecast can be found online at:

[Forecast Spread Sheet]

NOTE: *If you did not participate in the forecast process, you will still need to fill out a forecast form prior to requesting tags.*

② CONTRACT NEGOTIATION

The Project Sponsor works with BPA COTR to negotiate project budget and work statement.

③ PRE-APPROVAL

Upon agreement the Project Sponsor's tag requirement is approved by the COTR. (This typically occurs once per year prior to the beginning project performance period.)

④ PDRF APPROVAL

A PDRF will be created once a project is approved. The PDRF will be sent for approval to the Person of Contact (POC) designated on the Forecast Request Form. The POC will verify that all of the information on the PDRF is correct, revise as necessary, and email or fax the approved PDRF to Kristiana Kroneck.

⑤ DISTRIBUTE TAGS

Upon receipt of the approved PDRF PIT tags will be distributed as requested.

To find out if a project has been pre-approved, check the link ([Column K in the Forecast Spread Sheet]). Call your COTR if your project is not listed or approved for the proper amount.

FIGURE 1 • PIT-Tag Distribution Process
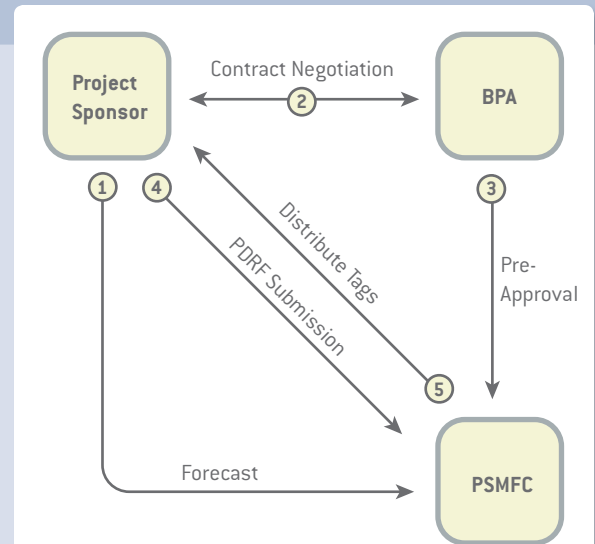
Digital Angel has released the new and improved TX1400SST (12mm) tag, as well as two other PIT tags. For details on tag type, consult the following articles, *"Three New PIT Tags on the Block"* in this issue, and *"More Information Regarding the New Tag on the Block"* in the [November 2005: Volume 6, Issue 5] PTAGIS Newsletter. The TX1400SST PIT-tag will be available for distribution this year, although PSMFC's PIT-tag distribution policy remains as: **first in first out.** Therefore, the TX1400SST PIT-tags will be available for distribution after PSMFC has distributed all of the remaining TX1400ST PIT tags.

For more information, email kristiana_kroneck@psmfc.org, or call 503-595-3100. Fax documents to 503-595-3232. ◎

THREE NEW PIT TAGS ON THE BLOCK

ROGER ANDERSON (DIGITAL ANGEL CORPORATION)

Digital Angel has developed new PIT tags that have been, or will soon be released to the general marketplace. Two of the tags, the TX1400SST (12mm) and TXP1420SST (20mm), have superior reading performance over the standard TX1400ST (12mm) and TX1415BE (23mm) tags currently used throughout the Columbia River Basin. The TXP1485B (8.5mm) has characteristics similar to the TX1415BE (23mm) and can be used for niche markets, such as smaller juvenile salmonids.

TX1400SST

The TX1400SST (12mm) tag is currently available for distribution. The TX1400SST (12mm) tag shares the physical characteristics and stability of the TX1400ST (12mm) with the performance of the TX1400SGL (12mm). Pacific States Marine Fisheries Commission (PSMFC) and National Oceanic and Atmospheric Administration - Fisheries (NOAA Fisheries) have conducted a number of performance tests on the TX1400SST (12mm) tag.

TXP1420SST*

The TXP1420SST (20mm) specialty tag is a direct replacement for the discontinued TX1415BE (23mm) and TX1410BE (19mm) tags. With characteristics similar to the TX1400SST (12mm) tag, and smaller physical dimensions and weight, the TXP1420SST (12mm) will outperform its 23mm predecessor, TX1415BE. The new TXP1420SST (20mm) tag will be available in December 2006. Digital Angel will carry a limited stock until demand justifies larger inventory.

TXP1485B (8.5mm)*

The TXP1485B (8.5mm) specialty tag is currently available in limited quantities. The TXP1485B (8.5mm) has the performance of the TX1415BE (23mm) tag with smaller physical dimensions and weight.

For further information contact Roger Anderson of Digital Angel Corporation via phone (651) 552-6580 or (612) 747-1732 (mobile), or email (randerson@digitalangelcorp.com). ◎
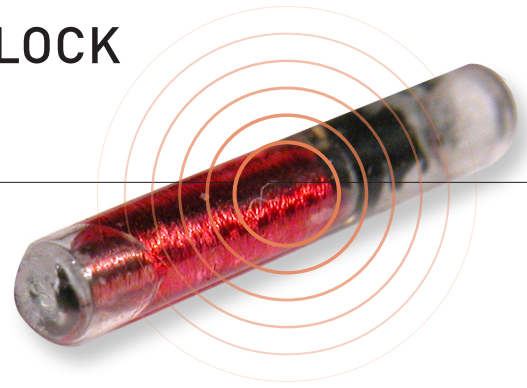
TABLE 1 ● PIT TAG MATRIX				
Parameter	**TX1400ST (12mm)**	**TX1400SST (12mm)**	**TXP1420SST (20mm)**	**TXP1485B (8.5mm)**
Length (mm)	12.45	12.48	20.0 (+/- 1.0)	8.5 (+/- .7)
Diameter (mm)	2.03	2.07	3.05 (+/- .04)	2.12 (+/- .03)
Weight (g)	0.1067	0.1020	0.370	0.067
Date Available	Limited Stock	In Stock	Limited Stock (12/2006)	Limited Stock

*Digital Angel has tested the PIT tags in a laboratory setting and suggests testing for the Columbia River Basin as requested by the PIT Tag Steering Committee (PTSC). The PTSC requested that NOAA Fisheries design a series of tests to evaluate how well new tag models would perform in the current network of interrogation systems. PSMFC and NOAA Fisheries will need to conduct a number of performance tests on the new tags.

Figure 1 • New Digital Angel PIT Tags

TXP1485B (8.5mm)

TX1400SST (12mm)

TXP1420SST (20mm)
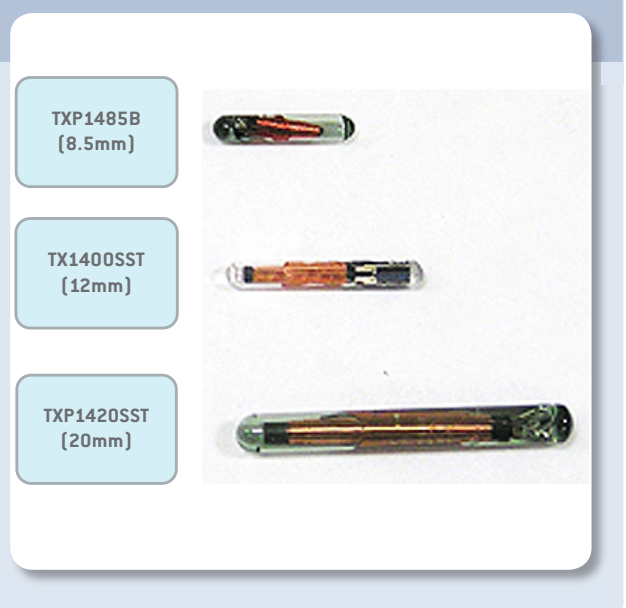
PTAGIS CLIENT SOFTWARE RELEASE

JOHN TENNEY (PACIFIC STATES MARINE FISHERIES COMMISSION)

In September, PTAGIS introduced new versions of all of its client software applications as part of a Spring/Fall release schedule. This article explains some of the new features and fixes available in the current release of each application. Additional details about the releases described below can be found in the README.TXT file available in the Download section for each software application on the PTAGIS Web Portal.
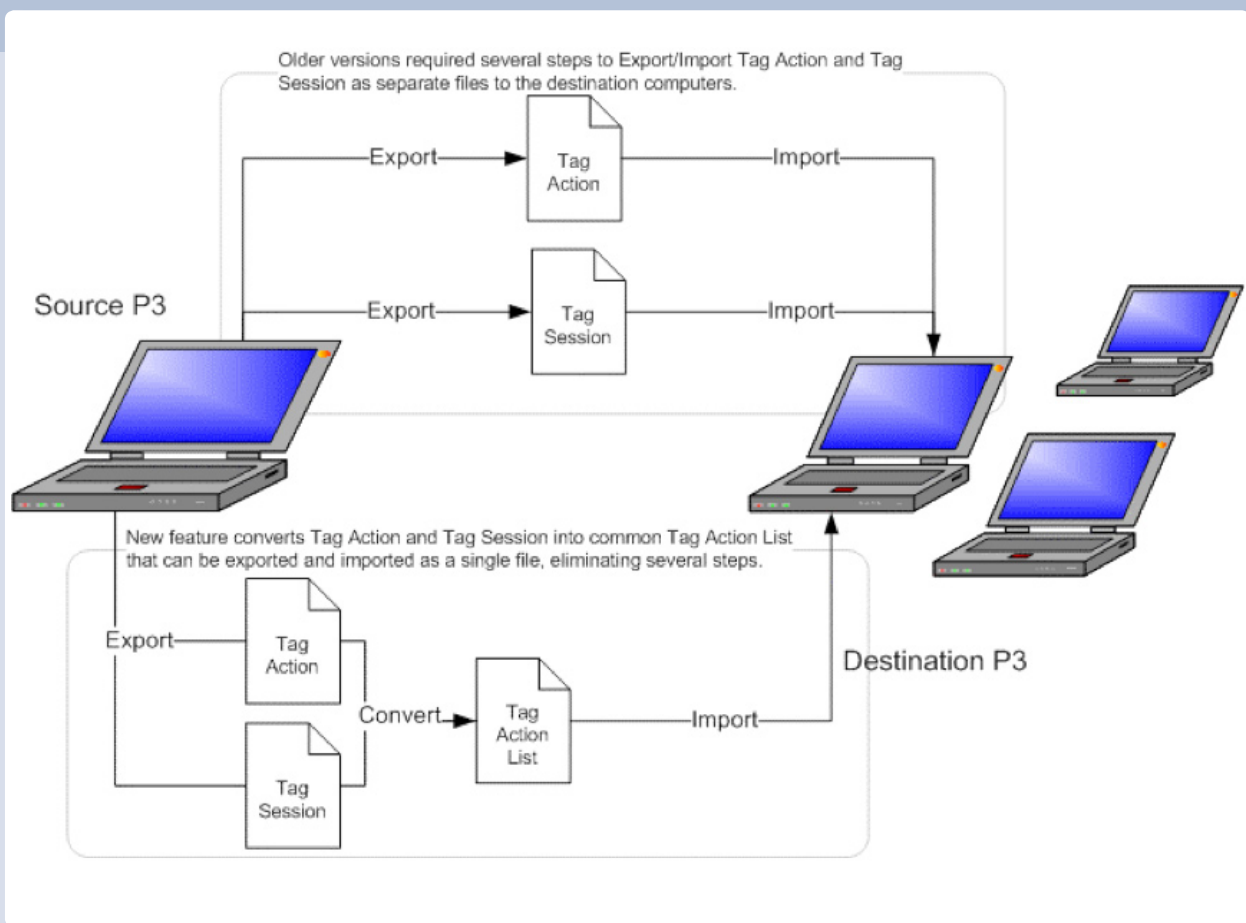
P3

Version: 1.4.3
Released: 9/14/06

A new feature in this release of P3 is the ability to export tag actions that reference tag sessions as a single unit.

The tag action feature is used to identify a target group of fish from tag codes in a list, or in one or more tag sessions. When users are marking in-river they often use a tag action that references the current tag session to identify fish that were previously marked that day. At the end of the day users export this tag action to a removable disk and replicate it to other nearby marking stations so they can identify any previously marked fish from other locations the following day.

P3 will now prompt the user to automatically convert a tag action referencing a tag session to a tag action with an internal list of tags. This converted tag action can be exported as a single unit, and simply imported to a destination P3 installation in one step. In addition, whenever a user imports one or more tag actions P3 will prompt the user to automatically activate these actions in the current profile.

FIGURE 1 • New P3 Feature for Exporting Tag Actions

Older versions required several steps to Export/Import Tag Action and Tag Session as separate files to the destination computers.

New feature converts Tag Action and Tag Session into common Tag Action List that can be exported and imported as a single file, eliminating several steps.

PTAGIS CLIENT SOFTWARE RELEASE

This release of P3 incorporates the additional fixes and features:

- Support for the *Sartorius Combics 1* electronic balance.

- Layout of the exported tag file was changed so that any associated note will have a blank line above and below to match the formatting style of past versions.

- Whenever a user changes the file name field associated with a tag session header, any previous upload history associated with the tag session will be reset.

MiniMon
Version 1.4.15
Released: 9/18/06

The most important fix in the latest release of MiniMon is related to the FS1001M Multiplexed Reader status reports. A few users noticed that whenever they set the Antenna Sequence setting to something other than numerical order, the antenna identifiers would be incorrectly listed within the status report (Figure 1).

This version of MiniMon correctly lists the present antenna identifiers in numerical order.

This release of MiniMon now supports half-duplex tags (HDX) read by the FS2001F Portable ISO Reader and output in FORM1. The tag code will be formatted to a 10 character hexadecimal value with "HDX" as the country code, for example: **HDX.00087646AF**.

MobileMonitor
Version: 1.1.2
Released: 9/19/06

The 1.1.0 release of MobileMonitor now supports PDA devices running the latest Windows Mobile 5 (WM5) operating system. Users can still download version 1.0.18 for older PDAs running Pocket PC 2000 and Pocket PC 2003. The WM5 1.1.2 release can be installed on an Ipaq H5550 running Windows Mobile 2003; however, because there are numerous variations of platforms for PDAs, PTAGIS cannot guarantee the WM5 release will work on all Windows Mobile 2003 platforms. PTAGIS is planning to release version 2.0 of MobileMonitor for Spring 2007, which should resolve issues related to disparate platforms. MobileSync Manager data-management

FIGURE 1 • FS1001M Multiplexed Reader Status Report

```
Reader Info:                    Version:  MUX1230.1.9

Reader ID# C0                   Unique: ON

Beep: ON                        Sent To Comm: ON

Buffer active: ON               Tag count: 1240

Memory used: 23%                Store Test Tag: ON

Diagnostics for C0:

Temperature: 38C                Exciter power: 22.0V

Current gain: 103%              Current alarm: 100mA

Noise scaling: 25%              Noise alarm: 50%

Sleep delay: 0ms                Noise delay: 0min

Test Tag delay: 60min           Message delay:

240min

Battery: OK                     Scan time: 100ms

System date: 8/1/2006           System time: 11:27

Antenna Seq.: 3,5,0,0,0,0,0,0,0,0,0,0

Diagnostics for Ant 00:

Exciter current: 498A           Signal level: 1%

Exciter phase: -1               Relay counter: 0%

Tune phase: 674                 Setup: 3AA

Vtt level: 20%

Diagnostics for Ant 00:

Exciter current: 518A           Signal level: 3%

Exciter phase: 0                Relay counter: 0%

Tune phase: 699                 Setup: 2D4

Vtt level: 20%

Alarms for C0: None
```

application supports both 1.1.x and 1.0.x releases of MobileMonitor.

In addition to supporting WM5 and VGA resolution, MobileMonitor 1.1.2 also includes the FS1001M status report fix listed above in the MiniMon section and supports HDX tags read from FS2001F Portable ISO readers and output in FORM1. ◎

M4: Latest Developments

JOHN TENNEY (PACIFIC STATES MARINE FISHERIES COMMISSION)

In previous articles, PTAGIS introduced the M4 Project as the next generation PTAGIS interrogation software to replace MiniMon and MultiMon. The M4 development team released an early alpha release of the software last month. This version of the software is an internal release and will not be available to the public. Only critical features of monitoring and Separation by Code (SbyC) have been included so that system performance can be evaluated.

This article will describe the laboratory performance evaluation that PTAGIS developed to assist in meeting the primary project objective, that "*M4 meets or exceeds the performance of the SbyC in Multimon.*"

Meeting the Objective

In order to successfully divert fish, the M4 software application must capture tag codes from several transceivers, lookup each tag code in a local database containing millions of records, and then send out a signal to trigger a gate – all within a fraction of a second. The application must run unattended for long periods of time without failure or performance degradation.

The laboratory performance evaluation described in this article is the first of three phases that will be used to verify that the software can successfully divert fish over a long period of time. The second phase will be a "live fish" test at one or more SbyC sites and is scheduled to coincide with a beta release of M4 next year. The evaluation phase will use existing PTAGIS efficiency reporting and monitoring to verify that a production release of M4 is successfully diverting fish once it is deployed into the Columbia River Basin.

## Laboratory Performance Evaluation

The laboratory performance evaluation consists of custom hardware and software to measure latency between transceiver and gate signals over several iterations. PTAGIS has also developed emulation software to put an additional load on the target software to simulate a large interrogation site during peak migration. This laboratory evaluation has already been put into use to compute the performance of MultiMon to serve as a benchmark for M4. Since this evaluation is fairly automated, regression testing can easily be performed to ensure that M4 remains within scope of the performance objective as new features are added.

Laboratory Components Overview

The following diagram describes the general relationship of each component used to simulate real-world conditions and measure the performance of the target platform (M4 or MultiMon) over an extended period of time.

The essential measurement of performance is the time the transceiver (Figure 1; Number 2) begins to transmit a tag code (Figure 1; Signal #1) subtracted from the time it takes that tag code to arrive at the target platform (Figure 1; Number 3) to be processed and a subsequent signal sent to the PLC (Figure 1; Number 5) to trigger a gate (Figure 1; Signal #2). This measurement is computed multiple times per second over a period of hours and is compiled into a custom application (Figure 1; Number 6) running on a separate computer. Meanwhile, emulation software (Figure 1; Number 4) is putting a standard load on the target platform to simulate real-world conditions.

FIGURE 1 • Laboratory Components
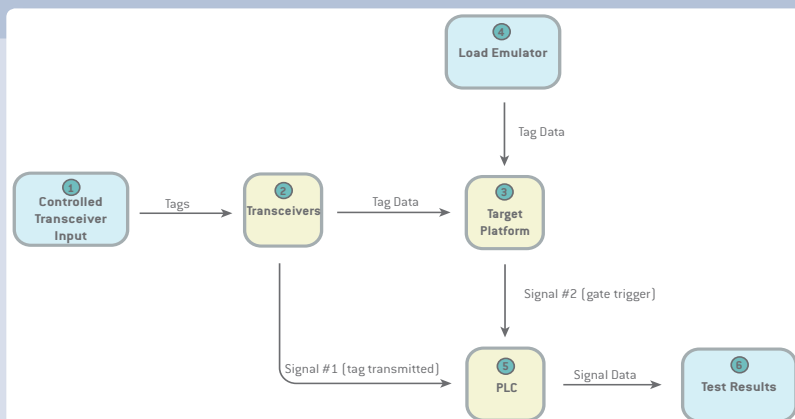
M4: LATEST DEVELOPMENTS

Laboratory Components Detail

The following describes each laboratory component from Figure 1 in more detail:

1. **Controlled Transceiver Input.** In order to supply a steady rate of tag data to the target platform, PTAGIS uses a test wheel that sends one or more PIT tags fixed to a belt through two antennas (Figure 2). The speed of the belt can be run at very high speeds to emulate fish passage.

2. **Transceivers.** Standard transceivers (Figure 3) capture the signal from the antennas located at the wheel. The tags are decoded and a PLC hardware device (Figure 5) monitors the transceivers to measure the time that each tag code is transmitted to the target platform.
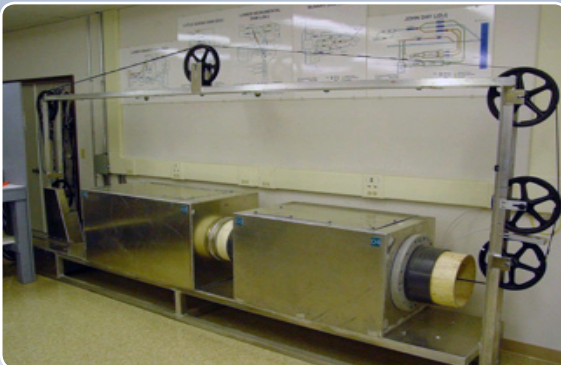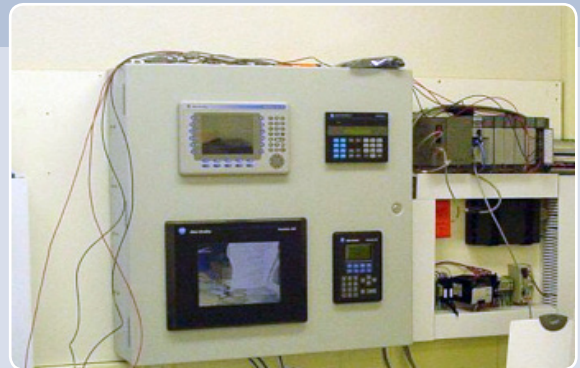
FIGURE 2 • Lab Wheel

FIGURE 3 • Transceiver

FIGURE 4 • Lab Wheel

FIGURE 5 • Programmable Logic Control (PLC)

3. **Target Platform.** The target application (M4 or MultiMon) runs on the same standard platform deployed at interrogation sites maintained by PTAGIS. The rack on the left in Figure 4 is a high-availability standard server platform for M4. The PCs located on the on the cart to the right in Figure 4 compose the existing MultiMon standard platform.

    Both M4 and MulitMon platforms are configured to monitor and divert for identical scenarios, so PTAGIS is performing an "apples-to-apples" performance evaluation. Each tag code from the transceivers in Figure 3 will cause the target platform to perform a lookup into a large database and then send "Signal #2" (Figure 1) to the same PLC device to trigger the gate.
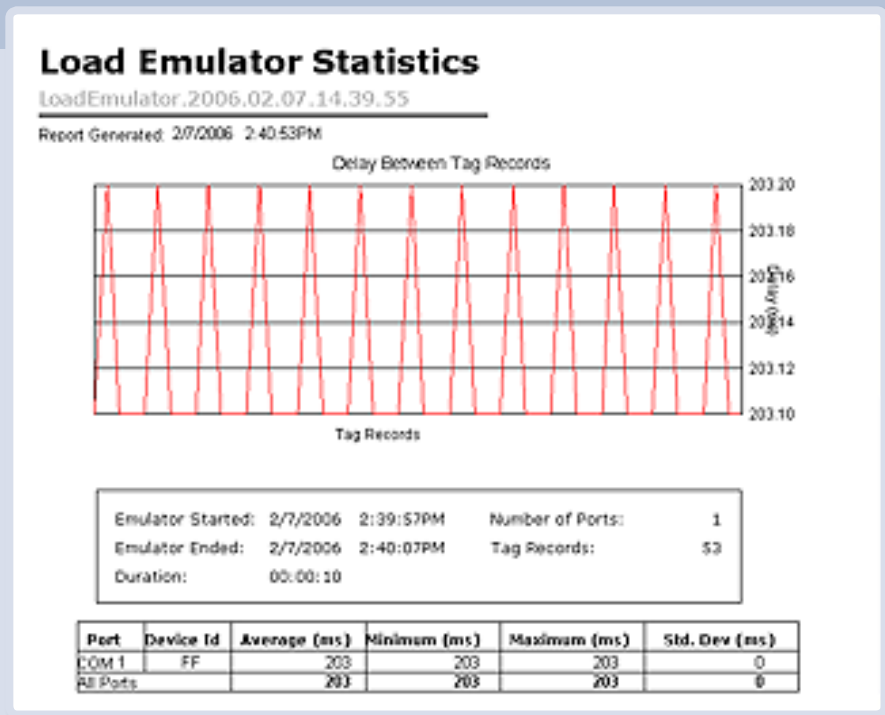
M4: LATEST DEVELOPMENTS

5. **Load Emulator.** PTAGIS developed a robust software application to emulate a real-world load of several transceivers sending data to the target platform. The Load Emulator can be configured to send a fixed rate of data from several "virtual transceivers," or it can compile actual PTAGIS data from a site to emulate actual conditions during peak-passage.

The Load Emulator software can generate a report (Figure 6) when the testing is complete to verify the intended load rate.

FIGURE 6 • Load Emulator

6. **PLC.** A Programmable Logic Controller (PLC) is used to capture and match the signals between the transceivers and target platform, and compute the latency delta for each signal pair in milliseconds (Figure 5) . PTAGIS had to customize a standard PLC to acquire the signals and perform the latency computation, and then make the data available for inspection.

Figure 7 • Test Results from the Logic Scrapper Application

7. **Test Results.** A custom application was developed to run on a separate computer to collect the PLC measurement data and compile it into a report showing a summary of latency trends during the testing period (Figure 7).
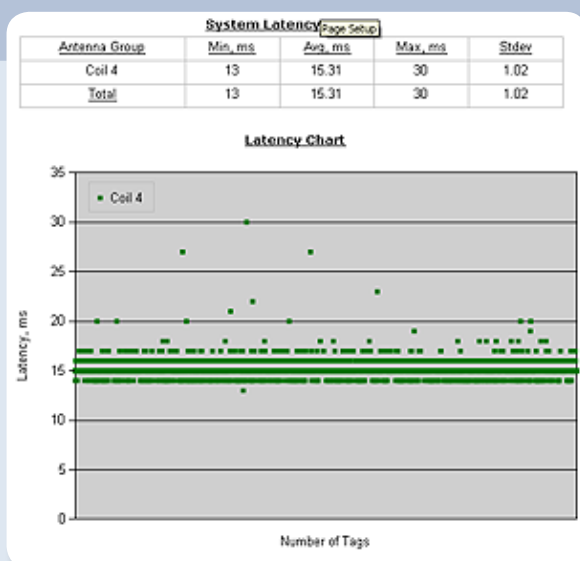
PTAGIS will be adding new features to M4 and performing extensive performance testing in the near future.

Project Status

Development of the M4 project has been put on hold so PTAGIS can reevaluate the high-availability requirements and platform solutions. As of very recently, PTAGIS decided to abandon expensive proprietary hardware fault-tolerant solutions and implement custom redundant (clustered) failover architecture similar to MultiMon. This decision will impact the project schedule; however, PTAGIS feels the custom solution will be less costly to maintain and provide more benefits to data collection platforms that require 99% uptime. ◉