

# TEMPO Program Update Release Notes

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## 1. Reflective Computing Web Site

We are pleased to announce our new web site. The home page URL is:

`www.ReflectiveComputing.com`

The web site will be used to distribute Program Updates and other information to TEMPO users.

## 2. Program Update Distribution via Web Site

Program Updates are now being distributed via our web site. Instead of receiving a number of large Program Update files in your email, you will receive an email notice that a new Program Update is available for you to download from our web site.

There are number of benefits in distributing Program Updates from our web site. Firstly, the download and installation procedure is simpler because only one .FZ file is downloaded for each of your TEMPO systems. Secondly, you have access to the most recent and previous Program Updates at any time; our web site is available 24 hours a day, 7 days a week. You no longer need to archive copies of your Program Updates because you can get them any time you want from the web site. Finally, a number of users were having problems receiving the Program Updates by email. Web site distribution should reduce or eliminate all of problems users were having with the email distribution.

Program Updates can be downloaded by going to the URL:

`www.ReflectiveComputing.com/ProgramUpdates`

In order to download Program Updates, you must have a valid login and password. If you have not been assigned a login and password, please contact Reflective Computing.

After logging in, you are presented with a list of Program Updates. Click to download the one you want. When you are finished download the updates, log off the web site and install your updates.

## 3. Program Update Organization

The organization of the Program Updates has been simplified. A single .FZ file is available on the web site for each of your TEMPO systems. Thus, if you have 4 TEMPO systems, you should download 4 files (tempo1.fz, tempo2.fz, tempo3.fz and tempo4.fz). Each FZ file contains a complete set of all the files you need for that TEMPO system.

The downloaded FZ file must be copied to the appropriate TEMPO client computer and installed (see Installing Program Updates, below) before the changes take affect.

## 4. Installing Program Updates

Follow these steps to install a Program Update.

1. Copy your current TEMPO directory to TEMPO.OLD. For example, open a Command Window and type:

```
xcopy \tempo\*.* \tempo.old\*.* /s
```

2. Download the program update file (i.e., tempo1.fz) from Reflective Computing's web site and copy to the C:\TEMPO directory.
3. Flip and unzip the files by opening a Command Prompt and typing:

```
cd \tempo
flip tempo1.fz
```

*Answer yes to unzip and yes to delete zip*

4. Run SETUPTN and remake your diskettes. We recommend that you use new diskettes to preserve the old ones in case you want to revert back to the older version.

## 5. Reverting To Previous TEMPO Software

If for any reason you want to revert back to the previous software version, you open a Command Prompt and type the following commands:

```
cd \
rename tempo tempo.new
rename tempo.old tempo
```

The original software is now in C:\TEMPO and the new software is in C:\TEMPO.NEW.

## 6. Incompatibilities with the Previous Release

This release is upwardly compatible from the previous release except where noted.

## 7. VideoSYNC random() and seed() Functions

Two new functions have been added to VideoSYNC.

The Random() function accepts one argument  $m$  where  $m > 1$ , and returns a uniformly distributed pseudo random number over the range zero to  $m-1$ .

Random()'s seed is initialized to a constant when VideoSYNC is loaded. This causes random() to return the same random sequence each time VideoSYNC is reloaded. Changing the seed allows you to change the sequence of numbers returned by Random().

The Seed() function accepts one argument,  $s$ , which is used to initialize the internal variables used by Random().

In general it is not necessary to call seed() since it is initialized when the VideoSYNC program is run. In this case, random() will return the same sequence of numbers each time VideoSYNC is run. You can vary this sequence each time you run your protocol by calling seed() with a value that is computed from the time or some other quantity that continually changes. For instance,

```
process INIT()
{
    dsendf("sv x = seed(%d)\n", timeus() << 16 + timeofday());
    ...
}
```

initializes VideoSYNC's seed to a value that is likely to be different each time the protocol is run. This will cause VideoSYNC's random() function to return a different sequence of numbers after the seed has been set.

## 8. VideoSYNC Expressions

VideoSYNC now supports expressions consisting of numeric constants, functions, variables and operators. VideoSYNC expressions can appear in place of any numeric parameter in any VideoSYNC's command. The functions and variables referenced in VideoSYNC expressions come from VideoSYNC's built-in functions and symbol table, not PCL's functions and or your protocol's symbol table.

VideoSYNC expressions can be useful in macros. For example, the VideoSYNC commands to create a macro that draws a small box at a random location on the screen would look like this:

```
DM box( )
    sv x = random(_xmax);
    sv y = random(_ymax);
    rf x, y, x+20, y+20;
EM
```

The box() macro executes on the VideoSYNC computer when your protocol sends "XM box()" to VideoSYNC.

```
dsendf( "xm box( )\n" );
```

Please refer to the VideoSYNC chapter in the TEMPO Reference Manual for information about macros.

VideoSYNC expressions have the same syntax, precedence and associativity as PCL expressions. VideoSYNC expressions are computed in 32 bit two's complement arithmetic; floating point computations are not available.

## 9. VideoSYNC Log File Enhanced

The VideoSYNC log file format has been enhanced to include the CPU clock time for each command. The first column, CLOCK, displays the DOS time as hours:minute:second.hundredths. This information is displayed regardless of whether the VideoSYNC computer's TSC (time stamp counter) clock is available. It is especially useful when the TSC is not available (i.e., on older computers).

## 10. Symphony Limited License For TEMPO Users

As data quantity grows and analysis becomes more complex, users are discovering that their analysis programs are taking an increasing amount of time to complete. In some cases, the amount of time it takes a computer to perform the analysis can become a bottleneck in the research process. Sometimes the problem can be resolved by reducing the amount of data processed or by getting a faster computer. Other times, these remedies are not enough.

Computations that can be partitioned into independent computational units are particularly suited for Symphony. For instance, if you need to process a large number of data epochs such that the processing for each epoch is independent of the processing of the other epochs, the computation can be performed by spreading epochs to a number of computers. The epochs can then be processed in parallel on multiple computers, thus reducing the overall processing time. One user has been using Symphony to process image data in this way and has reduced their overall compute time from 33 days to about 12 hours using 14 computers.

Symphony is new software that allows the user to build complex analysis programs that can be run on multiple computers. Symphony can take advantage of the wasted cycles on your existing computers and allow you to better utilize your current equipment.

The TEMPO and COBALT client programs include a Symphony server that allow your Symphony-enabled analysis software to retrieve data, protocol variables and control your protocol. It offers a super-set of the functionality provided by DDE (Microsoft's Dynamic Data Exchange). In particular, Symphony is network based so, unlike DDE, your analysis software can run on a different computer from the TEMPO or COBALT client.

We also offer a Symphony interface library for Matlab users so that users can run one or more instances of Matlab with their Symphony application. You can use Matlab as a Symphony node for performing some aspects of the analysis and you can run simultaneously multiple instances of Matlab to perform the computation on different data sets in parallel.

Symphony also includes spike sorting software and a number of useful nodes (programs).

TEMPO users with an active Program Update subscription will receive a limited license to run single-computer Symphony computations. If you would like to receive Symphony, please let us know and we'll send you the information you need.

## 11. Installing ASCII.FON in VideoSYNC

The VideoSYNC program supports the display of large font characters with the WD, TT, TS and TC commands. The following information has been added to the VideoSYNC chapter of the TEMPO Reference Manual. In addition, the TEXTFONT.PRO protocol has been enhanced and documented.

Before using the WD, TT, TS and TC commands, you must install a text font file. The ASCII.FON file is provided with VideoSYNC (see the WORDLIST.ZIP file in your VideoSYNC directory). To install ASCII.FON, follow these steps:

1. Create a directory on your client C: drive and unzip WORDLIST.ZIP into it. For instance, in a Command Window on your TEMPO client computer, type:

```
mkdir c:\vdosync
cd \vdosync
pkunzip c:\tempo\vdosync\wordlist.zip
```

You should see the following files in C:\VDOSYNC:

ascii.fon	4,996	12:32.14	20Nov91	Archv
list0.wrd	69	13:10.03	15Nov94	Archv
list1.wrd	82	13:11.17	15Nov94	Archv
wordlist.wrd	74	10:47.25	24Sep97	Archv

2. Run SETUPTN and set the following parameters:

```
VideoSYNC/Configuration/vsCdir=c:\vdosync
VideoSYNC/WordList/vsfont0=ascii.fon
VideoSYNC/WordList/vsword0=wordlist.wrd
VideoSYNC/WordList/vsbox=2,2
VideoSYNC/WordList/vsfc0=14,3
```

Then remake the VideoSYNC diskette.

3. Boot the VideoSYNC computer with the newly made VideoSYNC diskette.

4. Run TEMPOW, CLOAD TEXTFONT.PCF file (in your C:\TEMPO\PROWIN directory) and START the clock. You should see the word *Tempo!* appear at random locations in different sizes and colors.

## **12. FLIP Enhanced and Improved**

The FLIP installation program now has built-in capability to unzip files without the need for the PKUNZIP.EXE program.

FLIP also now correctly handles long file names.

When unzipping, FLIP has been enhanced to prescan the ZIP file to verify that all files it needs to create are accessible on the hard drive. In the past, if the user attempted to install a Program Update while a program like TEMPOW or NCM were running, the TEMPOW.EXE or NCM.EXE files were locked and therefore, FLIP could not update them. Now FLIP displays a warning message and tells you which files are locked. It then asks you to close those program before proceeding.

FLIP error messages have been enhanced for clarity and provide more detail than before when a problem is detected.

## **13. Vista Supported**

The TEMPO, COBALT and SYMPHONY software is now supported on computers with the Windows Vista Business 32 bit (US) operating system. Other versions of Vista may work; we simply haven't tested them yet.

## **14. Symphony/Matlab API: Accessing TEMPOW, COBALT and Symphony Nodes**

An Application Programming Interface (API) is available for Matlab users to access Symphony. With this API, Matlab users can implement Matlab programs that participate in Symphony computations.

In particular, since TEMPOW and COBALT contain Symphony data servers, Matlab users can use the API to replace all of the DDE functionality that was once available in Matlab before they broke their DDE interface: Matlab programs can receive epoch data from TEMPOW or COBALT during an experiment, get and set TEMPO's protocol variables and execute TEMPO commands using the Symphony/Matlab API.

For more information on the Symphony/Matlab API, please contact Reflective Computing.

## **15. TEMPONET, COBALT and VideoSYNC Support for Computers with 2 GB of RAM**

SETUPTN has been modified to create TEMPONET Server, COBALT Server and VideoSYNC diskettes that boot on computers with more than 2 Gb of RAM. Previously, the diskettes failed to boot due to a bug in one of the drivers. This problem has been corrected.

## **16. SETUPTN Support for Marvell Yukon Gigabit Network Controller**

SETUPTN now supports the Marvell Yukon 88E8056 PCI-E Gigabit Ethernet.

Support is provided for both NetBEUI and TCP protocols.

TEMPONET and COBALT servers and VideoSYNC computers can utilize this driver by setting SETUPTN's ethernet parameter to YUKND.

For example, to use the Marvell Yukon network driver with a TEMPONET server, use this setting in SETUPTN:

```
TEMPOServer/Network/ethernet=YUKND
```

## 17. Current Software Versions and Set Numbers

The TEMPO software is distributed as a matched set. When installing a Program Update, insure that the TEMPO software on all computers are updated from the same distribution.

TEMPOW	11.8 Set 40.13
COBALT	2.7 Set 40.13
SYMPHONY	7.1
SETUPTN	5.28
KSRV,KSRVB	11.5 Set 40.13
All KERNELS	11.02 Set 40
PCL	11.9 Set 40
KINFO	10.10 Set 40
HTB	10.1
VDOSYNC	12.01
BUGER	10.04
All DIAGNOSTIC	13.21 Set 40