REFTEK™

SOFTWARE RELEASE NOTES

for the

72A Series DAS

DAS DSP Code v2.48 to 2.60

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About this document

This document is a compilation of release notes for DSP code used in REFTEK 72A series Data Acquisition Systems from version 2.48 to the latest version. It provides a quick overview of the changes between each release of DSP code, and is supplemental to other, more comprehensive, REFTEK documentation. Use the release notes as a guide to identify the major changes.

A separate document records the changes made to the CPU code.
<table>
<thead>
<tr>
<th>Release Notes: PASSCAL Version 2.60 (June 3, 1994)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Modification of Handling of 24-bit Values</td>
<td>1</td>
</tr>
<tr>
<td>2 Elimination of Time Tag Error on Change of Year</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Modification of Handling of 24-bit Values</td>
<td>3</td>
</tr>
<tr>
<td>2 Modification of Justification of 24-bit Values</td>
<td>3</td>
</tr>
<tr>
<td>3 Modification to Right-shift all 32-bit Data</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Release Notes: PASSCAL Version 2.50 (February 8, 1993)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Correction of 24-bit Time Tagging</td>
<td>5</td>
</tr>
<tr>
<td>2 Modification of 32-bit Data Format</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Expansion of Raw Data Area</td>
<td>7</td>
</tr>
<tr>
<td>2 Relocation of Raw Data Area</td>
<td>7</td>
</tr>
<tr>
<td>3 Availability of DSP Code Version Label</td>
<td>7</td>
</tr>
<tr>
<td>4 Addition of 24-Bit Support</td>
<td>7</td>
</tr>
<tr>
<td>5 Addition of a New Gain Relay Function for 24-Bit Support</td>
<td>8</td>
</tr>
<tr>
<td>6 Address and Length Change for the General Transfer Area</td>
<td>8</td>
</tr>
<tr>
<td>7 Addition of 16-channel Support</td>
<td>8</td>
</tr>
</tbody>
</table>
DAS DSP Release Notes: PASSCAL Version 2.60 (June 3, 1994)

This section of this manual lists and describes the functional software modifications made to DSP code versions 2.51 and 2.51A to create DSP code versions 2.60 and 2.60A, as follows:

- Modification of handling of 24-bit values
- Elimination of time tag error on change of year

Note: The DSP code version 2.60 is used only in DAS units with the RT314 analog-to-digital converter/DSP board. Version 2.60A is used only in those units with an RT276 analog-to-digital converter/DSP board.

DSP code versions 2.60 and 2.60A are both backward-compatible with DAS CPU code version 2.58 or later.

1 Modification of Handling of 24-bit Values

Using DSP code version 2.60, a DAS can detect which 24-bit REF TEK analog-to-digital converter board it uses and adjust operations accordingly; a DAS unit with two A/D boards can even include boards of different types, such as an RT331 and an RT373.

2 Elimination of Time Tag Error on Change of Year

Previously, a DAS unit's handling of time tagging for 24-bit channels allowed the extremely rare possibility of a time tag error when time changed to a new year; DSP version 2.60 has corrected this problem.
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DAS DSP Release Notes: PASSCAL Version 2.51 (March 4, 1994)

This section of this manual lists and describes the functional software modifications made to DSP code versions 2.50 and 2.50A to create DSP code versions 2.51 and 2.51A, as follows:

- Modification of handling of 24-bit values
- Modification of justification of 24-bit values
- Modification to right-shift all 32-bit data

Note: The DSP code version 2.51 is used only in DAS units with the RT314 analog-to-digital converter/DSP board. Version 2.51A is used only in those units with an RT276 analog-to-digital converter/DSP board.

DSP code versions 2.51 and 2.51A are both backward-compatible with DAS CPU code version 2.50 or later. However, the Monitor and Offset functions of a DAS using DSP code 2.51 may give misleading results when performed on a 24-bit channel. A future release of DAS CPU code will include Monitor and Offset functions that work correctly with DSP code 2.51.

1 Modification of Handling of 24-bit Values

Previously, the DSP code converted 24-bit values from twos-compliment format to offset binary format before the DSP processed the data. DSP code version 2.51 does not perform this conversion, because the PGA in the DAS now provides the values to the DSP in offset binary format.

2 Modification of Justification of 24-bit Values

The values read for 24-bit channels by DAS DSP code version 2.51 are no longer right-justified (LSB-justified) and sign extended; they are now left-justified (MSB-justified) and zero-filled.
3  Modification to Right-shift all 32-bit Data

Using code version 2.51, the DSP now right-shifts all 32-bit data by eight bits before routing it to the CPU. Previously, the DSP right-shifted only 32-bit data obtained from 16-bit channels.

Note: The net result of the changes made for DSP code version 2.51 are summarized as follows:

- All the data provided by the DSP for the Monitor and Offset calculations is MSB-justified and in offset binary format.

- All 32-bit data, whether from a 16-bit or 24-bit analog-to-digital converter, is now provided by the DSP to the CPU as 24-bit, sign-extended data.

- All 16-bit data, whether from a 16-bit or 24-bit analog-to-digital converter, is now the most significant bits of the available data.
DAS DSP Release Notes: PASSCAL Version 2.50 (February 8, 1993)

This section of this manual lists and describes the functional software modifications made to DSP code version 2.48 to create DSP code versions 2.50 and 2.50A, as follows:

- Correction of 24-bit Time Tagging
- Modification of 32-bit Data Format

Note: The DSP code version 2.50 is used only in DAS units with the RT314 analog-to-digital converter/DSP board. Version 2.50A, which was released on February 25, 1993, is used only in those units with an RT276 analog-to-digital converter/DSP board.

1 Correction of 24-bit Time Tagging

Previously, the DSP code miscalculated the time tags for 24-bit data. DAS DSP code version 2.50 has resolved this problem.

2 Modification of 32-bit Data Format

The DAS DSP code version 2.50 handles 32-bit data for channels from a 16-bit analog-to-digital converter differently than previous DSP code. The DSP stores the 16-bit value in the upper 16 bits of a 32-bit word, as before. Also, the DSP generates the lower 16 bits from the filtering process as it did before. However, the DSP now right-shifts and sign-extends the 32-bit value by 8 bits when it is recorded.
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DAS DSP Release Notes: PASSCAL Version 2.48 (September 22, 1992)

This section of this manual lists and describes the functional software modifications made to DSP code version 1.04 to create DSP code version 2.48, as follows:

- Expansion of raw data area
- Relocation of raw data area
- Availability of DSP code version label
- Addition of 24-bit support
- Addition of a new gain relay function for 24-bit support
- Address and length change for the general transfer area
- Addition of 16-channel support

**Note:** Previous modifications for auxiliary data channels (v2.43) are NOT included.

1 **Expansion of Raw Data Area**

The raw data area has been increased from 16 bits per channel to 32 bits per channel. The DSP stores data from the 16-bit analog-to-digital converter in the upper 16 bits, and fills the lower 16 bits with zeroes. The DSP stores data from the 24-bit analog-to-digital converter as sign-extended 32-bit data.

2 **Relocation of Raw Data Area**

To accommodate its increased size, the raw data area is now in a new location within dual-ported Ram.

3 **Availability of DSP Code Version Label**

The DSP code version label is now stored in dual-ported RAM for the CPU.

4 **Addition of 24-Bit Support**

On power-up or system initialization, the DSP determines whether the DAS contains any 24-bit analog-to-digital converter boards and can use the 24-bit channels, if installed. The 24-bit channels for a DAS with only one 24-bit converter board are 4, 5, and 6. DAS units with two converter boards provide 24-bit data on channels 1-6.
5  **Addition of a New Gain Relay Function for 24-Bit Support**

A new function toggles the gain relays on 24-bit analog-to-digital converter boards. The CPU passes the gain setting to the DSP.

6  **Address and Length Change for the General Transfer Area**

The start address and length of the general transfer area have been changed.

7  **Addition of 16-channel Support**

Using DAS DSP code 2.48/16 only, the DAS supports 16 input channels with a sample clock (maximum sample rate) of 500 samples per second.

**Note:** The 2.48/16 DSP code must be used in conjunction with DAS CPU code of version 2.48S or later.