

The KAM/MEM/103 is a memory module which supports logging data to removable CompactFlash® memory cards. This document introduces the KAM/MEM/103 and outlines how to set it up using kSetup and DAS Studio 3.

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37.1 KAM/MEM/103 overview

The KAM/MEM/103 can store data on a CompactFlash card from any combination of data sources in an Acra KAM-500 system. The KAM/MEM/103 is designed to be used with a wide range of CompactFlash cards. Approved cards are listed in the *KAM/MEM/103* data sheet (as higher density CompactFlash cards become available, Curtiss-Wright approves them for use). Data storage can be triggered by a combination of discrete bits and analog signal levels. The KAM/MEM/103 saves data to a FIFO in blocks of 32,768 × 16-bit words. To read or erase the data, remove the CompactFlash card and insert it into a standard off-the-shelf CompactFlash card reader. Data can then be extracted using kFlashcardXID software.

NOTE: As with KAM/MEM/x03 modules, the KAD/MEM/004 can be used where physical access to the CompactFlash card is restricted. Initialization and data extraction are possible across Ethernet. For more information, see the *KAD/MEM/004* data sheet.

37.1.1 Key features of the KAM/MEM/103

- Supports removable solid-state memory cards
- Supports Type I & II removable CompactFlash cards (CompactFlash cards can be read with a USB card-reader or a PCMCIA adapter)
- Programmable event size
- Designed to support high-speed CompactFlash cards up to 128 GB
- Logs data at up to 2 Msps
- Recording trigger function

37.2 Setting up the KAM/MEM/103 using KSM-500

kSetup is included in the KSM-500 suite of tools. When setting up a KAM/MEM/103, you can set sampling rates for parameters, configure the triggering conditions and create stamp marks called headers.

37.2.1 Setting parameters

To set parameters, first select the KAM/MEM/103 in the Task Explorer pane of kSetup. The Parameters tab in kSetup (see the following figure) displays the parameter available for the KAM/MEM/103.

Parameter Name	Mode	Protocol	Comment
*	*	*	*
MEM103STATUS_0	STATUS	None	

Figure 37-1: Parameters tab in kSetup

For information on using kSetup, see the *kSetup* data sheet.

The Parameters tab contains only one parameter when the KAM/MEM/103 is selected in the Task Explorer pane. The MEM103STATUS parameter, which is used to monitor the status of the KAM/MEM/103, is a 16-bit status register. This parameter provides information regarding error codes (bits 0 to 5), the status of the KAM/MEM/103 (bits 6 to 8 which indicate whether the KAM/MEM/103 is full, recording data or idle), and how full the CompactFlash card is (bits 9 to 15). For more information on the MEM103 STATUS parameter, see the *KAM/MEM/103* data sheet.

NOTE: The recording bit (bit 7) of the MEM103STATUS parameter is refreshed after the first block is written to memory. Therefore if the acquisition cycle rate is slow, and the number of samples per cycle is low, it may take several seconds to save the first block and update this bit.

However, when both the acquisition cycle rate and the number of samples per cycle are high, the transition from low to high logical level may be too fast to be seen. For example, it takes 0.2 seconds to fill up the first block when logging 16 samples per parameter from 100 parameters, at an acquisition cycle of 100 Hz. Similarly, when logging 16 samples per parameter from 30 parameters, at an acquisition cycle of 10 Hz, it takes 6.8 seconds to fill up the first block.

37.2.2 Setup tab settings

On the Setup tab, you can define Header Setup options. When defining Header Setup options, you can set up to four 16-bit hexadecimal values as shown in the following figure.

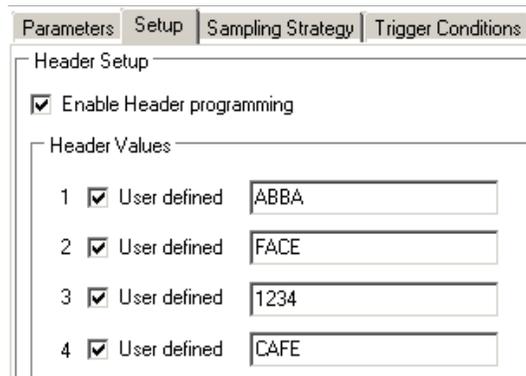


Figure 37-2: Header Setup options available when a memory module is selected in the Task Explorer pane

Alternatively, if a time code module, such as the KAM/TCG/102, is selected in the Task Explorer pane, you can select time parameters (see the following figure). Headers are saved to the CompactFlash card as each block is logged. Each header is displayed when extracting events from the CompactFlash card. For information on extracting events, see the *kFlashcardXID* data sheet.

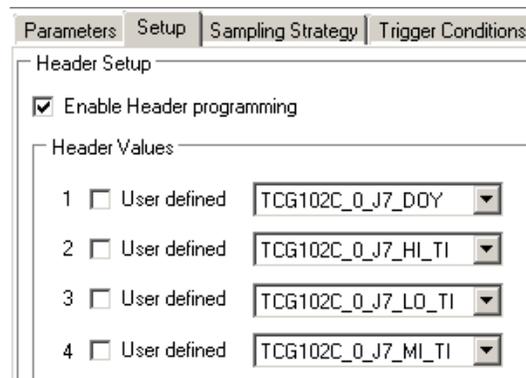


Figure 37-3: Header Setup options available when a time code module is selected in the Task Explorer pane

NOTE: Parameters from time code modules, selected as headers, cannot be added to the parameters to be logged list (on the Sampling Strategy tab).

WARNING: Headers can be changed only by reprogramming the KAM/MEM/103. If you see different headers on extracted data, it is a sign that the KAM/MEM/103 has been reprogrammed.

37.2.3 Sampling Strategy tab settings

On the Sampling Strategy tab (see the following figure), you can configure data to be logged on a KAM/MEM/103. This is done by setting the parameters to be logged and the desired numbers of samples per cycle (depending on the acquisition cycle).

On the Sampling Strategy tab, first use the > button to select the parameters you want to log. Then complete the fields described in the following table.

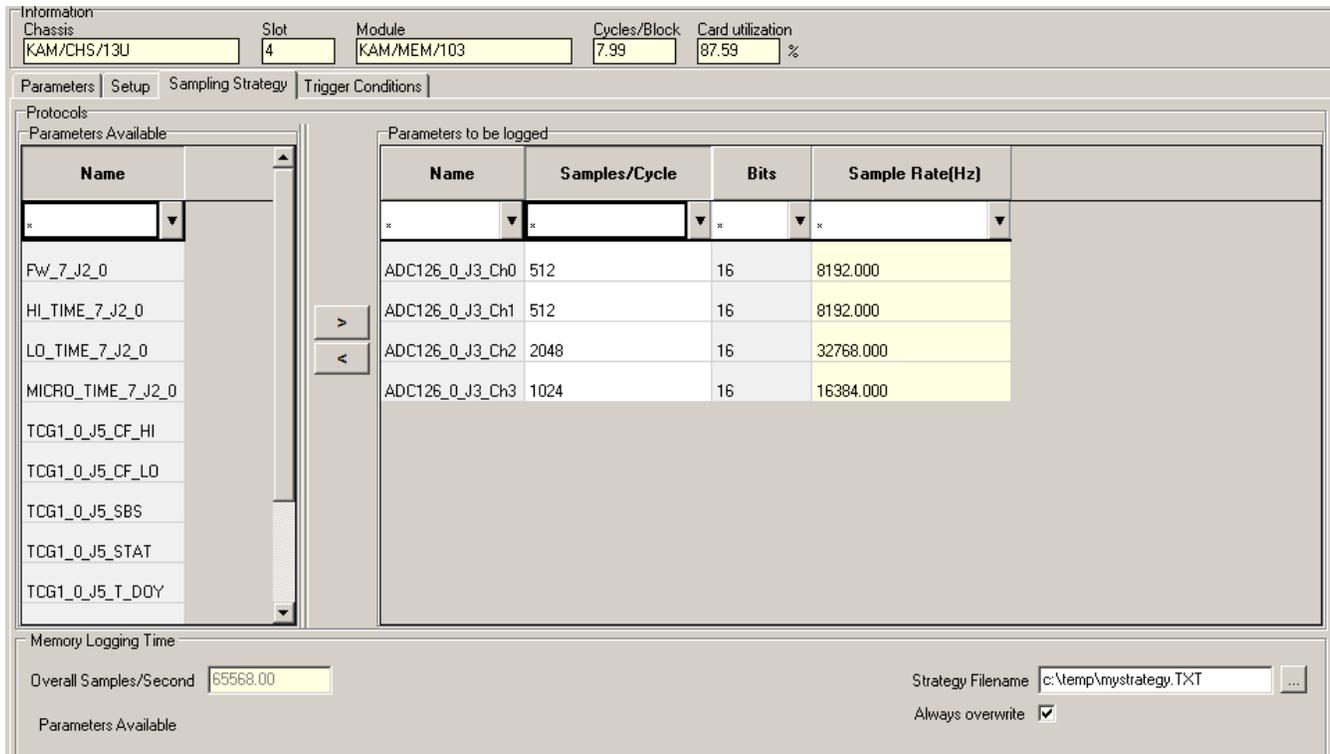


Figure 37-4: Sampling Strategy in kSetup

Table 37-1: Sampling Strategy tab fields

Field name	Description
Parameter Name	Read-only label for parameter selected from the Parameters Available list.
Samples/Cycle	Number of samples per acquisition that you want to log.
Bits	Read-only. The number of bits of the parameter to be stored.
Sample rate (Hz)	Rate at which parameters are stored in the KAM/MEM/103. To modify this, change the number of samples per cycle in the Samples/Cycle field.
Overall Samples/Second	Number of samples per second the KAM/MEM/103 logs. For information on the maximum sampling rates of the CompactFlash card used, see the <i>CompactFlash cards</i> data sheet. For information on constraints, see “37.2.3.1 Other fields” on page 4.
Strategy Filename	Important system file which must be stored in a secure location. This file is required for recovering data from the CompactFlash card. The strategy file documents the layout of data logged to the CompactFlash card and is created after verifying the task file. For details of the strategy file format, see the <i>kFlashAPIXID</i> data sheet.
Always Overwrite	Ensures the previous strategy file is overwritten when you click Verify on the kWorkbench screen.

NOTE: The value set in the Samples/Cycle field defines the sampling rate of a parameter. The KAM/MEM/103 stores only 16-bit parameters transferred over the backplane. A 32-bit parameter is transferred as 2×16 -bit backplane transfers. Ensure that the value set in the Overall Samples/Second field does not exceed the maximum sampling rate.

During initialization, using kFlashcardXID, you can upload the strategy file to the CompactFlash card. For details, see the *kFlashcardXID* data sheet.

37.2.3.1 Other fields

Other fields on screen include Cycles/block and Card utilization.

The value in the Cycles/block field is the number of acquisition cycle being stored in a 32-kilosample block. The number of words to be stored in one acquisition cycle is the sum of the value in the Samples/Cycle field for all parameters to be logged. The equation is $(32,768 - 16) / (\text{number of samples to be stored in one acquisition cycle} + 2 \text{ words for the sync word})$.

The value in the Card utilization field shows the card utilization to be used according to all the parameters you want to store. As the KAM/MEM/103 stores an integer number of acquisition cycle in a 32-kilosample region, a remainder is present.

Data is stored on two 32k word buffers before being written to the CompactFlash card. Data for at least two acquisition cycles must be written to the buffer before it is written to the CompactFlash card. Each buffer has space for 32,752 $(32,768 - 16)$ 16-bit words. Hence the maximum number of samples to be transferred per acquisition cycle is 16,376 samples / acquisition cycle.

For large amounts of data per second, we recommend setting a fast acquisition cycle. For example, to achieve 500 ksps, the slowest acquisition cycle is $500,000 / 16,373 = 30.5$ cycles/second.

When more than 16,376 samples per acquisition cycle are being logged to the KAM/MEM/103, you see an error during verification similar to the one shown in the following figure.

ACRA ERROR: Module KAM/MEM/103 has a invalid value of <number greater than 16376> for 'number of parameters in acq cycle'. Max value allowed is 16376

Figure 37-5: Sample error message displayed during verification

In the event you see this error message, we recommend either reducing the number of parameters, lowering the number of samples per acquisition cycle, or setting a faster acquisition cycle.

37.2.4 Trigger Conditions tab settings

A key feature of the KAM/MEM/103 operation is the memory trigger function. This allows you to define when, and under what conditions, the logging of data begins.

If triggering is used with the KAM/MEM/103, you may set two triggers (Trigger A and Trigger B); each of these triggers have their own individual settings tab in kSetup. To set triggers as analog or digital triggers, select the Use Triggers field (see the following figure) on the Trigger setup tab and then complete the appropriate fields described in the following table.

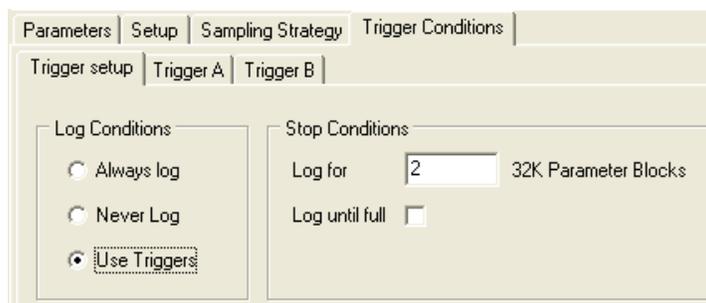


Figure 37-6: Trigger Conditions tab in kSetup

Table 37-2: Trigger setup

Field name	Description
Log Conditions	
Always log	Start logging data as soon as the system powers on.
Never Log	Do not log under any circumstances.
Use Triggers	Start logging according to the trigger setup and stop conditions.
Stop Conditions	
Log for	Number of 32k parameter blocks to be logged. 2 is the minimum number of blocks, that is, the minimum size of an event is 64k (2 × 32k) samples.
Log until full	When a trigger condition is met, the KAM/MEM/103 logs data to the CompactFlash card until the card is full or the system powers off. If you select this option, the last block being logged may be lost or corrupted.

When Always log is set, the KAM/MEM/103 continuously logs the amount of blocks set in the Log for field and stop logging only when the trigger conditions are no longer met. The following two figures show the stop conditions using the minimum number of blocks.

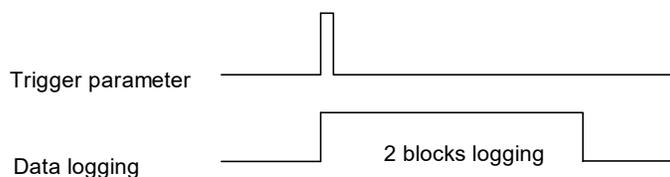


Figure 37-7: Example of stop logging using 2 as the minimum number of blocks and a pulse as the trigger

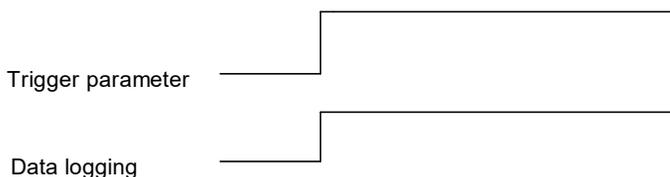


Figure 37-8: Example of logging using 2 as the minimum number of blocks and the trigger remaining active

If the number of cycles per block and the length of the acquisition cycle is known, it is possible to calculate the minimum logging time. For example, if Log conditions is set to Use Triggers, the Log for field is set to 10 blocks, the acquisition time is 10 ms, and the Cycles/Block is 9.5, then the minimum logging time can be calculated using the following formula:

$$\text{Logging time} = (\text{blocks to log}) \times (\text{cycles / block}) \times \text{acquisition cycle} = 10 \times 9.5 \times 0.01 = 950 \text{ ms}$$

After this time, if the trigger conditions are still met, the KAM/MEM/103 keeps logging for the same amount of time indefinitely until the trigger condition is removed or the CompactFlash card is full.

NOTE: The minimum number of blocks that can be recorded after triggering is two and the maximum log time is 65,535, that is 4 GB. Therefore, for a 32-GB CompactFlash card, if more than 4 GB of data is logged, the KAM/MEM/103 records a new event at this time (despite the active trigger condition).

37.2.4.1 Setting the trigger condition with an analog representation

In the example shown in the following figure, channel 0 of the analog module acts as the trigger to start logging data when its input is between 50,000 and 60,000 in decimal.

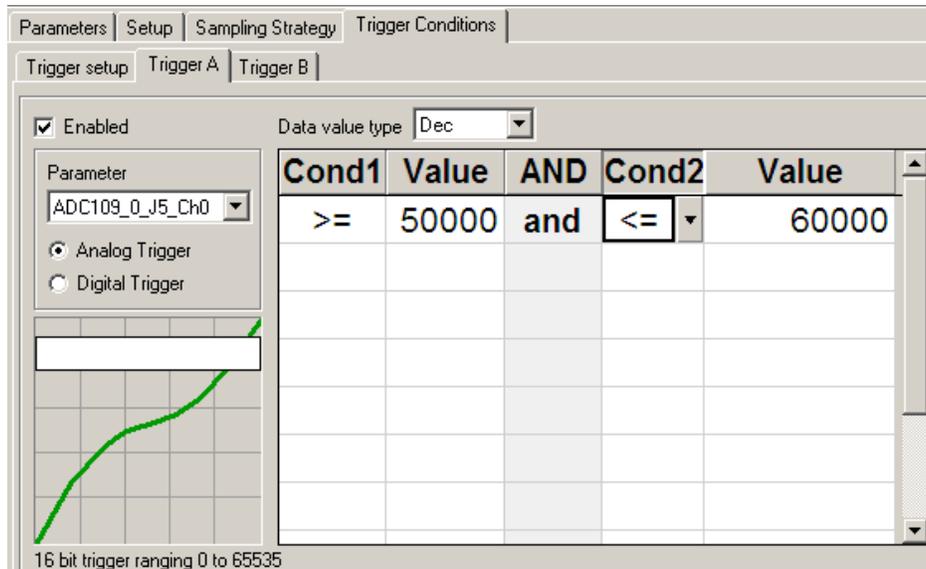


Figure 37-9: Analog trigger settings

37.2.4.2 Setting the trigger condition with a digital representation

The digital trigger continuously compares, bit by bit, the value of the parameter set as trigger, with the trigger binary mask. The digital trigger is activated once conditions defined are reached. In the example shown in the following figure, a parameter (LO_TIME) from the backplane controller module (KAD/BCU/xxx) is used as a trigger parameter.

NOTE: LO_TIME represents seconds and centiseconds (R[15:0] BCD 00.00-59.99 seconds). Therefore, in this example, triggering starts at five seconds and any centiseconds. The KAD/MEM/103 starts logging data every minute after the first five seconds, if Log until full (on the Trigger setup tab) is not selected, or continuously after the first five seconds, if Log until full is selected).

Although the bits of the digital trigger bit mask are ANDed by default, they can be ORed by selecting OR Bits together as shown in the following figure.

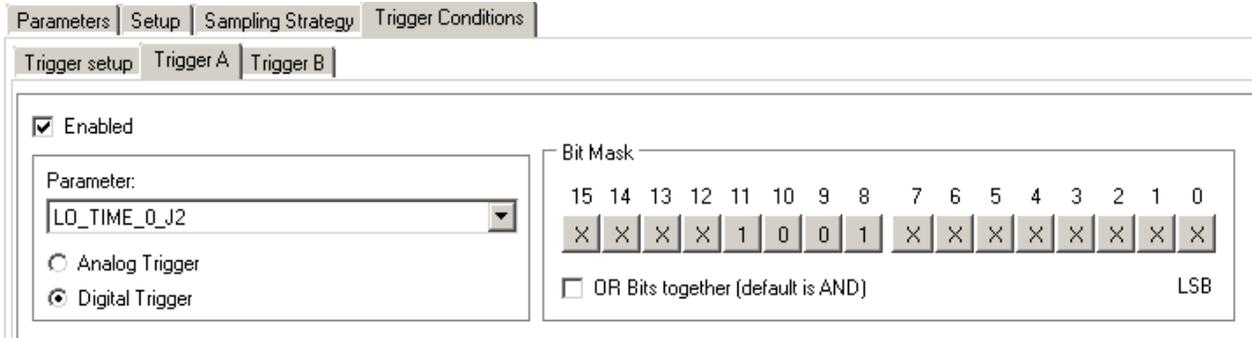


Figure 37-10: Digital trigger settings

37.2.4.3 Triggering recommendations

The results of both triggers (Trigger A and Trigger B) are ANDed together to determine when logging is to start. Therefore, both triggers must be active for logging. In the scenario where both triggers are disabled, they are set to always produce a combined inactive result. In the scenario where one trigger is enabled, the disabled trigger is set to always produce an active result. Therefore, when the enabled trigger is active, the combined trigger results are active.

Due to the digital filter delay present in all analog modules, we recommend you always use an analog trigger in combination with a parameter taken from a digital module (that has no filter delay) such as the encoder module or a KAM/TCG/102, in order to avoid false triggers and therefore undesired events.

Backplane controller modules such as the KAD/BCU/xx1 and KAD/BCU/105 have a status register, which incorporates a MEM_TRIGGER bit. The MEM_TRIGGER bit can be used to trigger the KAM/MEM/103. This bit is tied to a physical pin on the KAD/BCU/xx1, enabling you to trigger the KAM/MEM/103 externally by means of a switch. For information on the pin connection and register definition, see the respective KAD/BCU/xxx data sheet.

NOTE: Only 16-bit parameters can act as triggers.
The KAD/BCU/140 does not have a MEM_TRIGGER pin.

37.3 Setting up the KAM/MEM/103 using DAS Studio 3

When setting up a KAM/MEM/103, you can set sampling rates for parameters, create stamp marks called headers and create Bit Mask Alarm processes.

37.3.1 Setting parameters

To set parameters, first select the KAM/MEM/103 in the Navigator and then click the **Settings** tab. The Settings tab displays parameters that are available for the KAM/MEM/103 as shown in the following figure.

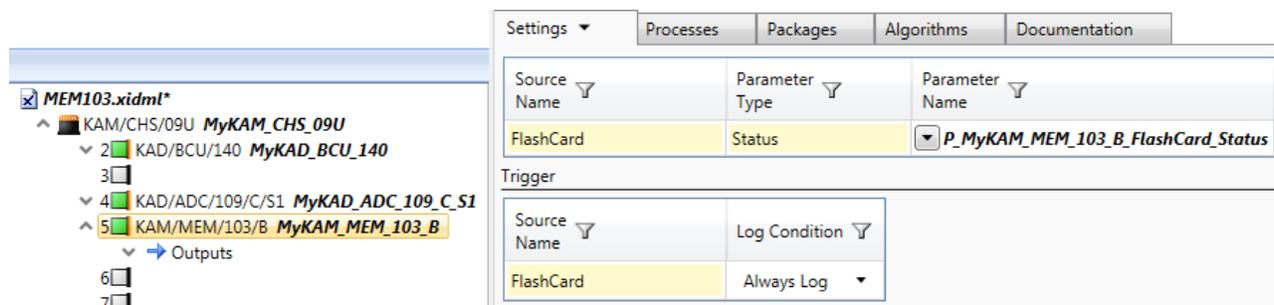


Figure 37-11: Settings tab in DAS Studio 3

The Settings tab contains only one parameter when the KAM/MEM/103 is selected in the Navigator. The Status parameter, which is used to monitor the status of the KAM/MEM/103, is a 16-bit status register. This parameter provides information regarding error codes (bits 0 to 5), the status of the KAM/MEM/103 (bits 6 to 8, which indicate whether the KAM/MEM/103 is full, recording data or idle), and how full the CompactFlash card is (bits 9 to 15). For more information on the MEM103 STATUS parameter, see the *KAM/MEM/103* data sheet.

NOTE: The recording bit (bit 7) of the Status parameter is refreshed after the first block is written to memory. Therefore, if the acquisition cycle rate is slow, and the number of samples per cycle is low, it may take several seconds to save the first block and update this bit.

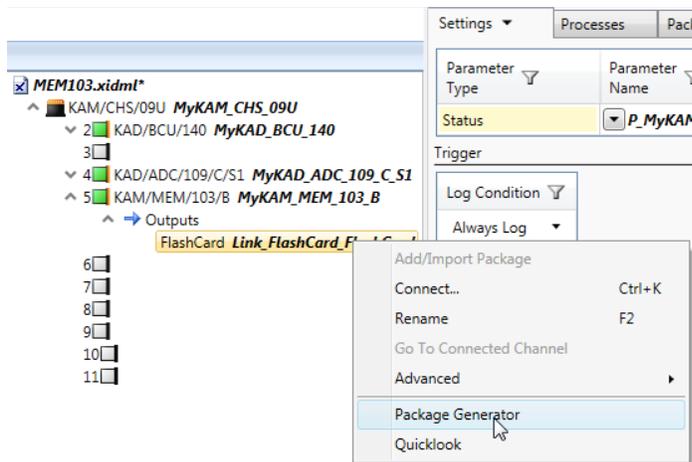
However, when both the acquisition cycle rate and the number of samples per cycle are high, the transition from low to high logical level may be too fast to be seen. For example, it takes 0.2 seconds to fill up the first block when logging 16 samples per parameter from 100 parameters, at an acquisition cycle of 100 Hz. Similarly, when logging 16 samples per parameter from 30 parameters, at an acquisition cycle of 10 Hz, it takes 6.8 seconds to fill up the first block.

37.3.2 Parameters to be logged

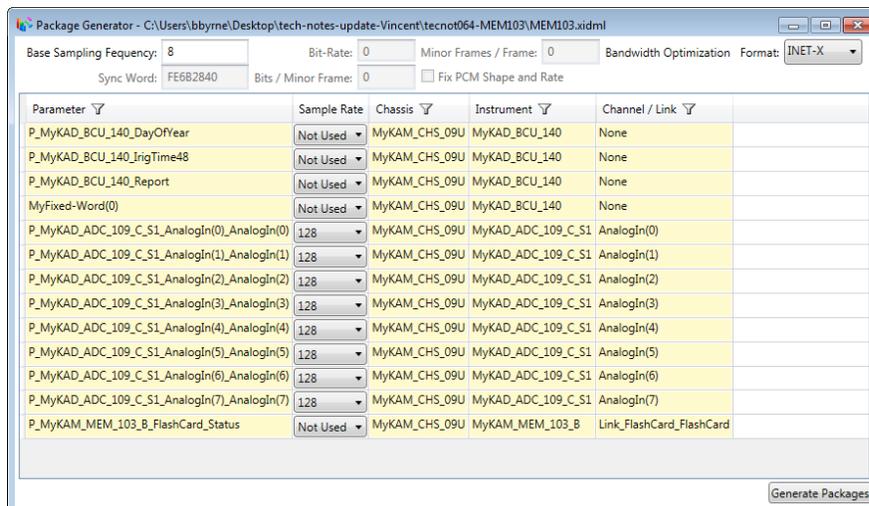
There are two ways you can define parameters that are to be logged to the CompactFlash card: using Package Generator or using Add/Import Package.

37.3.2.1 Using Package Generator

1. Expand the **KAM/MEM/103** node and then expand the **Outputs** node.
2. Right-click the **FlashCard** link node and then click **Package Generator**.



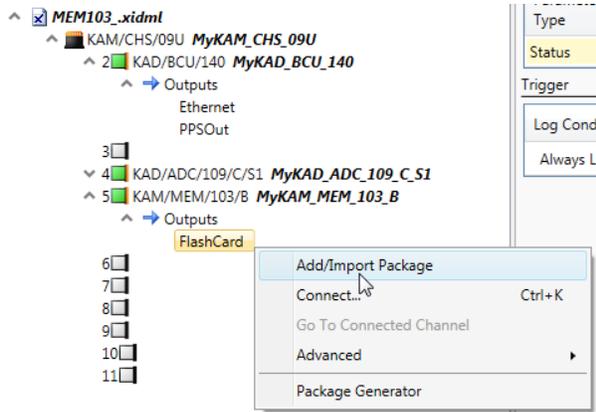
The **Package Generator** dialog box opens.



3. Select the **Sample Rate** for each parameter to be logged to the CompactFlash card and then click **Generate Packages**. For further details, refer to the *DAS Studio 3 User Manual*.

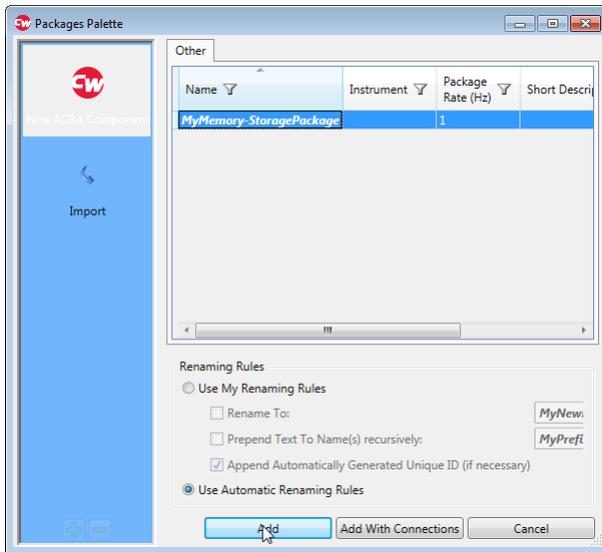
37.3.2.2 Using Add/Import Package

1. Expand the **KAM/MEM/103** node and then expand the **Outputs** node.
2. Right-click the **FlashCard** link node and then click **Add/Import Package**.



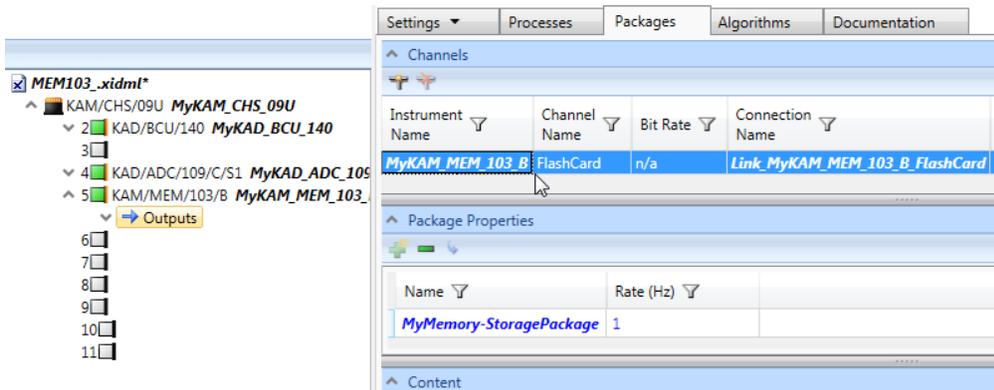
The **Packages Palette** opens.

3. Select **MyMemory-StoragePackage** and then click **Add**.

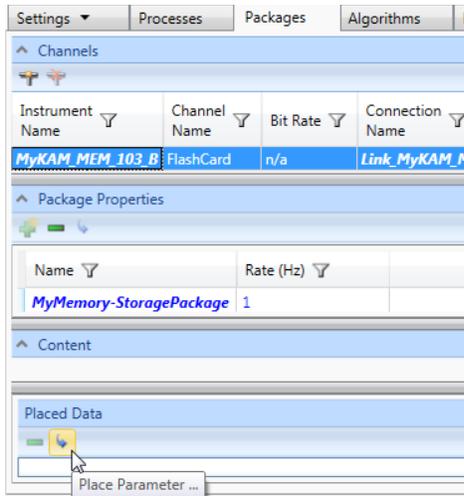


4. With **KAM/MEM/103 Outputs** still in context, click the **Packages** tab and then click the **MyKAM_MEM_103_B** row in the **Channels** pane.

When the screen refreshes, the **MyMemory-StoragePackage** is visible in the **Package Properties** pane.

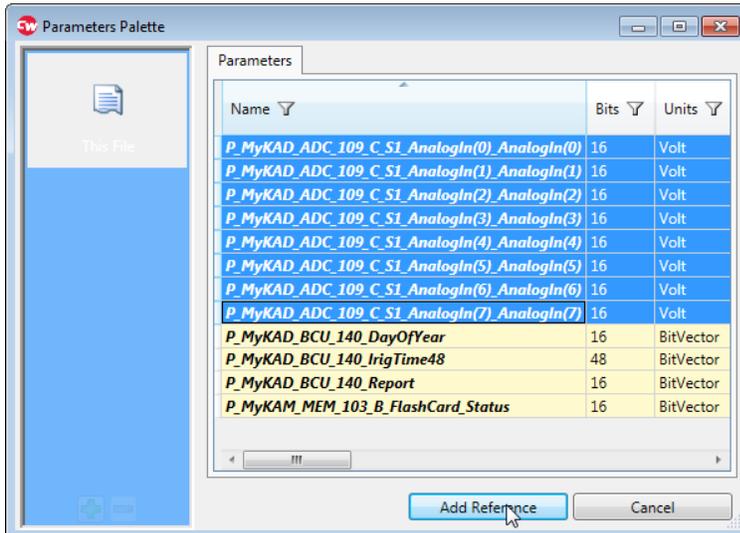


- In the **Placed Data** pane, click the **Place Parameter** button.



The **Parameters Palette** dialog box opens,

- Select the parameters you want to be logged to the KAM/MEM/103 and then click **Add Reference**. Refer to the *DAS Studio 3 User Manual* for details on adding packages and parameters.



NOTE: A strategy file will be created in the MEM_Strategy folder after compilation/programming in the location where DAS Studio 3 is installed.

The strategy file is required for recovering data from the CompactFlash card. It documents the layout of data logged to the CompactFlash card and is created after verifying the task file. For details of the strategy file format, see the kFlashAPIXID data sheet.

37.3.2.3 Tips for logging data at a high rate

The KAM/MEM/103 is limited to 16 kilosamples per acquisition; this section provides a work around for this limitation.

The number of words to be stored in one acquisition cycle is the sum of the value in the Actual Rate field for all parameters to be logged divided by the acquisition cycle. The acquisition cycle in DAS Studio 3 is the lowest package rate.

The equation is: $(32,768 - 16) / (\text{number of samples to be stored in one acquisition cycle} + 2 \text{ words for the sync word})$

As the KAM/MEM/103 stores an integer number of acquisition cycle in a 32-kilosample region, a remainder is present.

Data is stored on two 32k-word buffers before being written to the CompactFlash card. Data for at least two acquisition cycles must be written to the buffer before it is written to the CompactFlash card. Each buffer has space for 32,752 $(32,768 - 16)$ 16-bit words. Hence the maximum number of samples to be transferred per acquisition cycle is 16,376 samples / acquisition cycle.

For large amounts of data per second, we recommend setting a fast acquisition cycle. For example, to achieve 500 kbps the slowest acquisition cycle is $500,000 / 16,373 = 30.5$ cycles/second.

When more than 16,376 samples per acquisition cycle are being logged to the KAM/MEM/103, you see an error during verification similar to the following.

```
97000 06/12/2016 08:54:07.0200: Failed to generate for module
KAM/MEM/103/B - Failure in set_mem_acqu_cycles_per_block -
Cannot log 16386 words to memory in a single acquisition cycle,
maximum allowed is 16376 for channel FlashCard on instrument
MyKAM_MEM_103_B
```

Figure 37-12: Sample error message displayed during verification

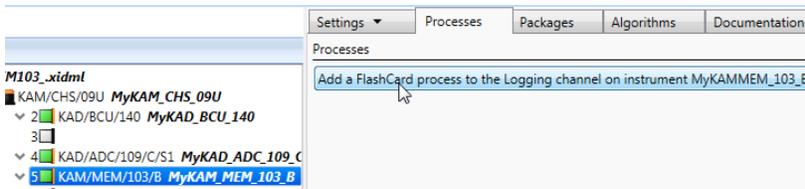
In the event you see this error message, we recommend either reducing the number of parameters, lowering the number of samples per acquisition cycle, or setting a faster acquisition cycle.

To ensure you do not exceed the writing speed of the CompactFlash card being used, calculate the overall sampling rate being written to the KAM/MEM/103. For maximum sampling rates for supported CompactFlash cards, refer to the *CompactFlash cards* data sheet.

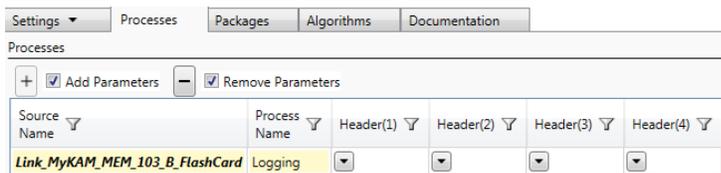
37.3.3 Headers

This section describes how to create stamp marks called headers. Headers are saved to the CompactFlash card as each block is logged. Each header is displayed when extracting events from the CompactFlash card. For information on extracting events, see the *kFlashcardXID* data sheet.

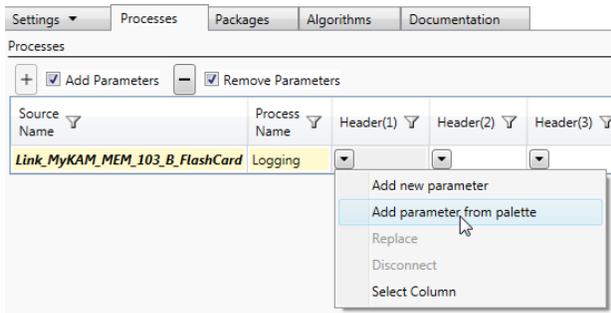
1. With the **KAM/MEM/103** in context, click the **Processes** tab.



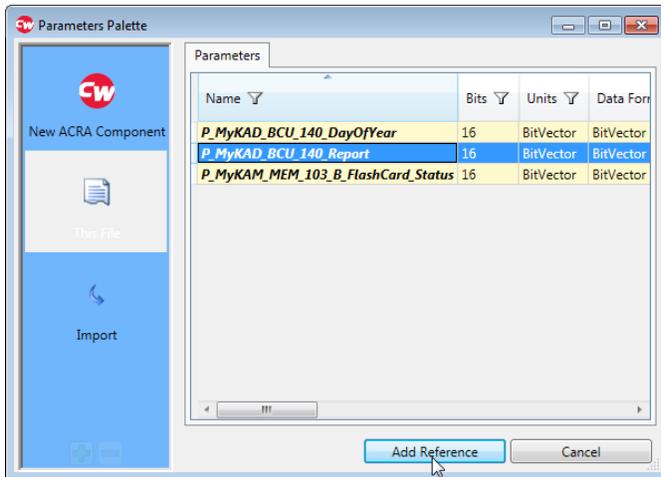
2. Click **Add a FlashCard process to...**



3. In the **Header(1)** column, click the drop-down arrow and then click **Add parameter from palette**.



- In **Parameter Palette**, click the **This File** library button.



- Select a parameter and then click **Add Reference**. Refer to the “Processes tab” chapter in the *DAS Studio User Manual* for further details.

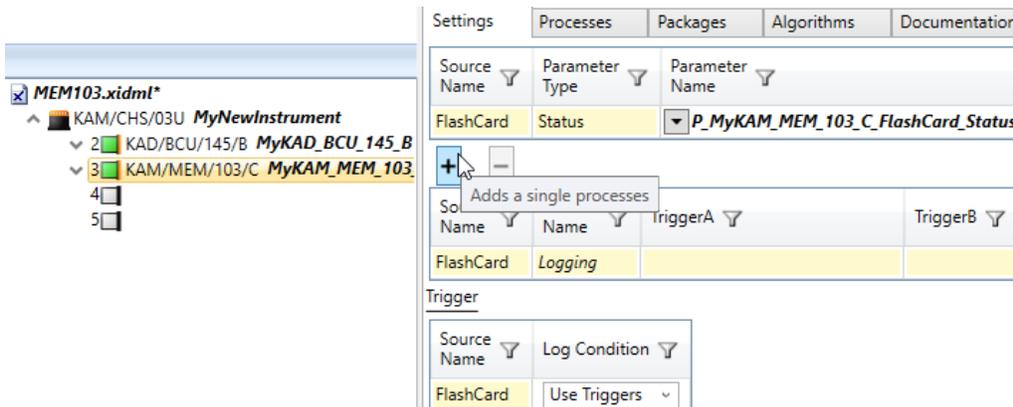
NOTE: Parameters selected as headers, cannot be added to MyMemory-StoragePackage.

WARNING: Headers can be changed only by reprogramming the KAM/MEM/103. If you see different headers on extracted data, it is an indication that the KAM/MEM/103 has been reprogrammed.

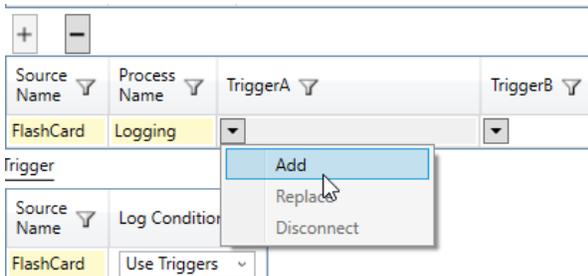
37.3.4 Creating a Bit Mask Alarm process

This section describes how to add a trigger.

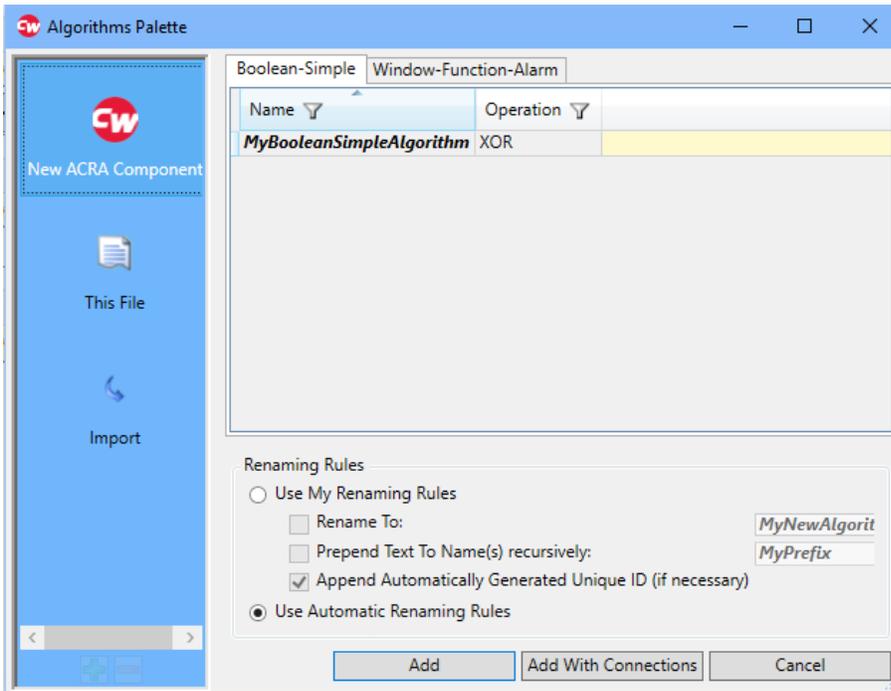
- With the **KAM/MEM/103** in context, on the **Settings** tab click **+** to add a process.



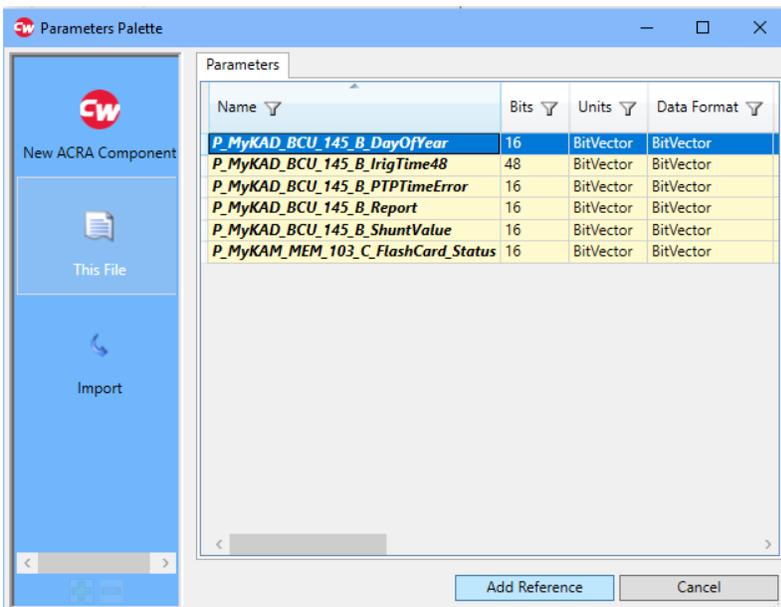
- In the **TriggerA** field, click the drop-down arrow and then click **Add**.



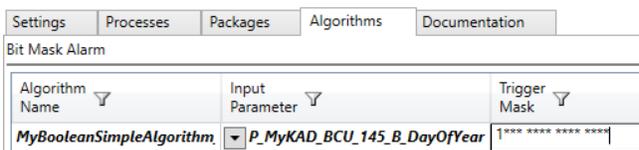
- The **Algorithms Palette** opens. Select the **Boolean-Simple** or **Windows-Function-Alarm** tab and then click **Add**.



- The **Parameters Palette** opens. Click the **This File** library, select the parameter you want to trigger and then click **Add Reference**.



- On the **Algorithms** tab, in the **Trigger Mask** field, type `1*** ** ** ** *`. This mask ignores all other bits except bit 15 and triggers when bit 15 is 1.



37.4 CompactFlash card overview and the KAM/MEM/103

CompactFlash cards are removable mass storage devices. The history of these memory cards is closely linked to the widespread distribution of digital photographic cameras. The KAD/MEM/103 is designed to support high-speed CompactFlash cards up to 128 GB.

As higher density CompactFlash cards become available, they can be used with the KAM/MEM/103 without the need for hardware or software upgrades.

37.4.1 Viewing data

The CompactFlash card requires initializing, using `kFlashcardXID` or `kFlashAPIXID`, before you can begin logging or viewing data. For more information, see the *kFlashcardXID* data sheet.

To view data logged to the CompactFlash card, the different applications which can be used are described as follows:

- GS Works: the CompactFlash card can be used as a standard source for GS Works; for more information, see the *GS Works* data sheet.
- `kFlashcardXID`: initializes CompactFlash cards and extracts logged data; for information on the different output files, see the *kFlashcardXID* data sheet.
- `kFlashAPIXID`: allows you to extract the data in a specific format that `kFlashcardXID` doesn't support. The *kFlashAPIXID* data sheet details the different functions provided by the API and describes the structure of Curtiss-Wright data.

NOTE: `kFlashAPIXID` is provided with the `kFlashcardXID` installation; `kFlashAPIXID` is recommended for software developers only.

37.4.2 Care of CompactFlash cards

The CompactFlash card should be considered as a hard disk. We recommend using the Windows `Chkdsk` utility or the `Scandisk` (for earlier versions of Windows) utility from time to time. If a file system error occurs on the CompactFlash card, Windows can repair it before problems potentially occur during data acquisition.

If `Chkdsk` or `Scandisk` identifies file system problems on a CompactFlash card, format the card using Windows FAT file system. When formatting the CompactFlash card for the KAM/MEM/103, use Windows FAT32 file system.

37.5 Troubleshooting and tips

37.5.1 Hot swapping not allowed

CompactFlash card hot swapping is not allowed. The KAM/MEM/103 retrieves the CompactFlash card's size at power-on. Therefore, it is important to power on the Acra KAM-500 system with the CompactFlash card inserted. Similarly, to avoid data loss and/or corruption, power should be off before extracting the CompactFlash card from the KAM/MEM/103.

37.5.2 Restrictions

Multiple formats are not supported in KAM/MEM/003, KAD/MEM/004, KAM/MEM/004, and KAM/MEM/103. Only Format select 0 is supported.

`kSetup` supports only one KAM/MEM/103 card per Acra KAM-500 chassis, which can be placed in any user-slot.

37.5.3 Maximum logging rate

The maximum rate for recording to the CompactFlash card is 2 Msps, however not all CompactFlash cards support this rate. The maximum logging rate depends on the manufacturer of the CompactFlash card and on the card's capacity. For information on logging rates, see the *KAD/MEM/103* data sheet.

37.5.4 Boot-up time

The CompactFlash card has a controller, which manages data storage and retrieval, defect handling and diagnostics, power management, and clock control. Boot-up time depends on the CompactFlash card (for details, see the *CompactFlash Cards* data sheet).

37.5.5 Always log

The Always log option (on the Trigger setup tab) is not recommended when using the KAM/MEM/003, the KAM/MEM/003/B, the KAM/MEM/003/C, and the KAM/MEM/004. These modules start storing even if the CompactFlash card boot-up has not finished, and corruption of the first block in the event occurs.

We recommend that you use a trigger with the modules mentioned. Alternatively, to request a module upgrade, contact Curtiss-Wright support (acra-support@curtisswright.com).

37.5.6 Extraction and initialization benchmarks

For extraction and initialization benchmark details, see the *kFlashcardXID* data sheet.

NOTE: Extraction time is strongly dependent on the USB CompactFlash card reader used.

37.5.7 Networked systems and time synchronization

In a networked data acquisition system, all chassis with network controllers, for example KAD/BCU/105 and KAD/BCU/140, synchronize their internal clocks with the PTP Grandmaster on a 2-second time boundary (for more information, see a *KAD/BCU/xxx* data sheet). Synchronization can imply an abrupt time adjustment that happens once after power-on and once every time the KAM/MEM/103 synchronizes with a time master.

If a KAM/MEM/103 is present in the system, and Always Log is set, the adjustment in time results in the loss of data for the length of an acquisition cycle of data at the time of adjustment, and a subsequent cycles of invalid data sometime after the adjustment.

37.5.8 Associated software

The following table displays software available for use with all memory modules produced.

Table 37-3: Memory module history

Module	Software required for module setup	Software required for:		Comments
		Initialization	Extraction	
KAM/MEM/003	KSM-500 KSMv2	KSMv2	KSMv2	Supports Type I CompactFlash cards only. Supports FAT16 only. The first block logged may corrupt if Always log is set.
KAM/MEM/003/B	KSM-500 KSMv2	KSMv2	KSMv2	Supports Type I and II CompactFlash cards. The first block logged may corrupt if Always log is set.
KAM/MEM/003/C	KSM-500 KSMv2	kFlashcardXID	GS Works kFlashAPIXID kFlashcardXID	Supports CompactFlash cards up to 8 GB in size. The first block logged may corrupt if Always log is set.
KAM/MEM/003/D	KSM-500	kFlashcardXID	GS Works kFlashAPIXID kFlashcardXID	Supports CompactFlash cards up to 128 GB in size. Always log option fixed.
KAM/MEM/003/E	DAS Studio 3 or KSM-500	kFlashcardXID	GS Works kFlashAPIXID kFlashcardXID	Added knurled head captive screw.
KAM/MEM/103	KSM-500	kFlashcardXID	GS Works kFlashAPIXID kFlashcardXID	Supports Type I and II CompactFlash cards. Maximum logging rate of 2 Msps.

Table 37-3: Memory module history

Module	Software required for module setup	Software required for:		Comments
		Initialization	Extraction	
KAM/MEM/103/B	DAS Studio 3 or KSM-500	kFlashcardXID	GS Works kFlashAPIXID kFlashcardXID	The /B revision corrects an issue where the KAM/MEM/103 fails to start logging correctly with a KAD/BCU/105 in an X-SYNC slave chassis.
KAM/MEM/103/C	DAS Studio 3 or KSM-500	kFlashcardXID	GS Works kFlashAPIXID kFlashcardXID	The /C revision corrects an issue where the KAM/MEM/103 fails to start logging correctly with a KAD/BCU/140/C.
KAD/MEM/004	KSM-500	kFlashcardXID	GS Works (using raw file only) kFlashAPIXID kFlashcardXID	The first block logged may corrupt if Always log is set. For information on using raw files, see the <i>kFlashcardXID</i> data sheet.
KAD/MEM/004/B	DAS Studio 3 or KSM-500	kFlashcardXID	GS Works (using raw file only) kFlashAPIXID kFlashcardXID	Always log option fixed. The /B revision corrects problems with capacity reporting at power-on and initialization at high temperatures.

37.6 Frequently asked questions

Question: “After querying the CompactFlash card with kFlashcardXID, I don’t see any event stored”.

Answers:

- Ensure the trigger was applied correctly. For this, you just need to monitor the memory status and check whether the logging bit is set correctly.
- As the KAM/MEM/103 needs to log at least a block (32,768 × 16-bit words) before saving data to the CompactFlash card, you may not have waited long enough. Time to fill a block = cycles/block × cycle frequency.
- Curtiss-Wright guarantees only the correct operation of CompactFlash cards validated and approved for use with the KAM/MEM/103. For more information, see the *KAM/MEM/103* data sheet.

Question: “When using Windows Explorer to browse files on the CompactFlash card, why do I see only a readme.txt file and a strategy file?”

Answer: From the KAM/MEM/003/C onwards, data is logged directly on the CompactFlash card, that is, Windows FAT 32 is not used. The memory module doesn’t have a file controller, that is, a microprocessor, to allow such file management. Data logged on the CompactFlash card cannot be viewed using Windows Explorer. A backup copy of the contents of the CompactFlash card can be created using kFlashcardXID.

Question: “Why does Curtiss-Wright provide an API to extract the data instead of providing the data format on the CompactFlash card?”

Answer: The API is intended for use by software developers. The main reason for using the API is that Curtiss-Wright may change the data format on CompactFlash cards used with future memory modules. Using an API makes any future changes transparent to customers using Curtiss-Wright memory modules. The structure of the data logged on the CompactFlash card is described in the *kFlashcardXID* data sheet.

37.7 Further reading

The following documents are related to this technical note:

CompactFlash cards data sheet

GS Works data sheet

KAD/BCU/101, *KAD/BCU/105*, and *KAD/BCU/140* data sheets

KAM/MEM/103 data sheet

kFlashcardXID data sheet

kFlashAPIXID data sheet

KSM/STE/002 data sheet

DAS Studio 3 data sheet and *DAS Studio 3 User Manual*

TEC/NOT/039 - Using the KAM/MEM/003/B

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