There are some major enhancements in Firmware Version 04.XX.XX that you need to be aware of.

In July, 2007 manufacturing started shipping transmitters in limited quantities with Release 04.01.16 firmware that incorporated Modbus, Fieldbus Foundation™ communication protocols, and Feature Keys. Since that time additional firmware development and testing has been performed. All transmitters shipped from Wallingford will be equipped with release 04.02.XX in the very near future.

The document entitled *SONARtrac® Hardware Changes V4.02.xx Features Firmware & Software Overview* prepared by the Embedded Systems Group details the changes in Hardware and Firmware. I strongly recommend you read over this document to become familiar with the hardware and firmware changes.

Major changes that impact us from a Customer / Technical Support point of view are as follows:

A. Distributing Firmware

It is extremely important that full Firmware Releases and Feature Keys not be given to Customers or Distributors. The full firmware release contains programs (such as SONARtrac Pro) and documents that are proprietary. Please contact Technical Support for assistance with providing software and firmware to customers and distributors.

B. Feature Keys

Firmware Release 04.01.XX uses Feature Keys to change transmitter capability. The keys are similar to the multiple firmware versions currently used. Feature Keys will take the place of having Boot and Main Versions of Flow (F), GVF/SOS (S), and Flow/GVF/SOS (A) plus communication options that need to be loaded depending upon the desired capability of the transmitter.

The Feature Key will be used to select transmitter capability (VF, GVF/SOS, VF/GVF/SOS) and the communications mode. **Note:** A transmitter must also have Fieldbus Hardware installed to provide that capability.

Once the Manufacturing and Customer Support procedures are fully in place, Features can be turned on or off by loading a 'Key File' that can only be used with the specified transmitter. This ensures that a Key File cannot be used on other transmitters to enable features.

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		

The Key File is created by a utility to be used only within CiDRA, and can be loaded into a transmitter using any application that can use the SONARtrac DLL (SONARtrac Basic (StBasic), SONARtrac Field Service Utility (StFSU), SONARtrac Pro (StPro), Flow Development (FlowDev)) or using the SONARstick. The SONARstick will use a script file (like programming) to load a key file.

When new code is loaded into a transmitter in manufacturing, most features will be disabled. The HART protocol will be enabled for backward compatibility. This will require manufacturing to turn on VF or GVF or both using the new feature control process. This was previously done by loading a different firmware image (All, Flow Only and SOS Only builds).

When upgrading a transmitter that is running older code, the 4.0 code will check the previous image on the first boot-up, and will enable features based upon the build type of the previous image. This will ensure that during an upgrade, a VF Only meter will remain so, for example, without having to load a Feature Key File.

Feature Keys are a major step in allowing us to control which transmitter operating mode (both current and future) is installed on a transmitter and for us getting payment for transmitter features on a transmitter by transmitter basis. Features will not be able to be copied from one transmitter to another transmitter in an uncontrolled manner.

B.1   Universal Feature Key Naming Convention

Available Features are **F**low, **S**OS, **H**ART, **M**ODBUS, **F**ieldbus (the bold underlined letter is used in the naming code).

A file which enables all features would be named:

Feature_Universal_V4.02.23 - FSHMF.sff
(the second F is Fieldbus)

A file with a feature disabled replaces that letter with a dash:

Universal_Key_V4.02.23 - FSHM-.sff
(Fieldbus disabled)

The naming is unimportant to the transmitter or software. It is simply to indicate what is in the feature file.

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		

B.2 Feature Key Location

The initial release of Feature Keys will be as 'Universal Feature Keys' that allow for changing the feature of any transmitter equipped with Firmware Release 04.XX.XX. They will not be transmitter specific at this time.

Since Universal Feature Keys are an enabling feature that will allow us to easily charge for upgrade features, they will be kept in a separate folder (Feature Control folder) from the software release.

In-house access is at: *\\25kpn\product release\volumetric flowmeter*

Secure web site access is:
https://secure43.easycgi.com/cidra/partner/filetransfer/collaboration_secure_rep_https.asp?rd=Flow_Software

B.3 Currently Available Feature Keys

The following is a list of Feature Keys.

Universal_Key_V4.02.23 – F----.sff	Universal_Key_V4.02.23 – F-H-F.sff	Universal_Key_V4.02.23 – F-HM-.sff
Universal_Key_V4.02.23 – FS---.sff	Universal_Key_V4.02.23 – FSH--.sff	Universal_Key_V4.02.23 – FSH-F.sff
Universal_Key_V4.02.23 – FSHM-.sff	Universal_Key_V4.02.23 – -S---.sff	Universal_Key_V4.02.23 – -SH--.sff
Universal_Key_V4.02.23 – -SH-F.sff	Universal_Key_V4.02.23 – -SHM-.sff	Universal_Key_V4.02.23 – F-H--.sff

Table 1   Currently Available Feature Keys

The above list will be added to as additional transmitter features (e.g. SPL reporting) are added.

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		

B.4 Field Utility Location for Features

The Features sub-menu is found under the Transmitter menu.
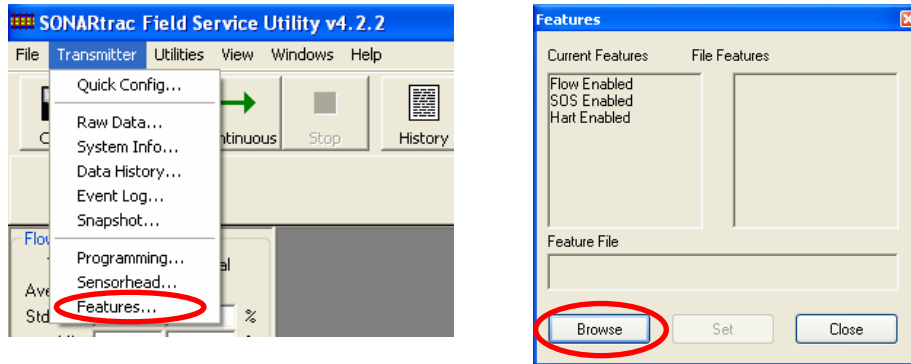

Figure 1   *Features Sub-Menu*

Select Features from the Transmitter drop-down menu and then select Browse, locate the desired Feature Key in the Feature Control folder and then select it.

C. SONARtrac Support Programs and USB Program Naming

Beginning with Firmware Release 04.02.XX, SONARtrac support programs StBasic, StFSU, StPro, FlowDev and the Alchemy (USB) programs will be renamed such that the first 2 digit fields coincide with Firmware Release. This change has been made to eliminate confusion with which field utility will work with which Firmware Release.

For example, StFSU Version 04.02.YY will work with Firmware Release 04.02.XX. The XX and YY digits are independent of each other.

D. MODBUS and Fieldbus Foundation Communication Protocols

Firmware Release 04.01.XX and later has provisions for MODBUS and Fieldbus Foundation communication protocols.

A user guide for MODBUS can be found at *http://www.cidra.com/document_library/20959-01_Manual-Use_of_Modbus_Protocol_with_SONARtrac_Transmitters.pdf* or on our web site.

A user guide for Fieldbus Foundation can be found at *http://www.cidra.com/document_library/20958-01_Foundation_fieldbus_protocol.pdf* or on our web site.

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		

E. Programming Wizard

Transmitter re-programming has been made much easier through the use of a programming Wizard. The Wizard is a "follow the prompt" routine that requires minimal user interaction.
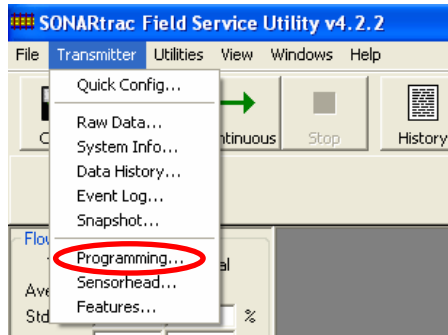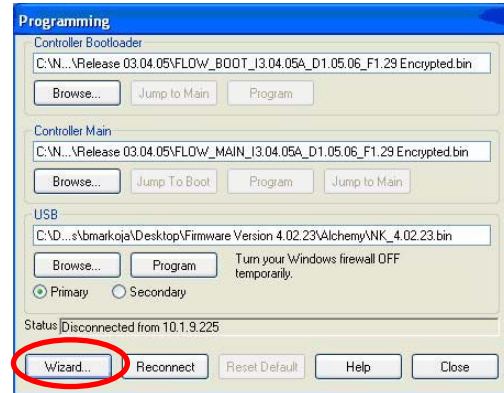

Figure 2   *Programming Wizard*

Select Programming from the Transmitter drop-down menu, select Wizard and follow the instructions.

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		

CiDRA Corporate Services   50 Barnes Park North   Wallingford, CT 06492
Tel. 203-265-0035   Fax. 203-294-4211   www.cidra.com

F. Data History Viewer

A Data History Viewer is located under the Utilities drop-down menu. The Data History Viewer is a very useful program that enables the viewing of large Data History files. The user can zoom in on events to analyze them. The user can also add filtering to the raw data history to optimize filter setups.
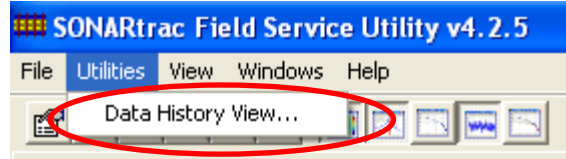

Figure 3   Data History Viewer

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		

CiDRA Corporate Services | 50 Barnes Park North | Wallingford, CT 06492
Tel. 203-265-0035 | Fax. 203-294-4211 | www.cidra.com

G. PC Transmitter

The PC Transmitter application is the actual SONARtrac transmitter and USB code compiled to work on a Windows PC. This allows a user without the transmitter hardware to investigate the menu system of the transmitter, as well as the USB menu and functionality. The application simulates the detection of a USB memory stick, and reads and writes from a directory on the PC, which allows the user to read and write files as if that directory were a USB memory stick attached to the transmitter.

The application displays randomized results to demonstrate a working meter, and will also display the outputs for both of the 4-20mA channels, the front panel LED and the pulse output. Note that this code does not include the DSP code, so changes to the algorithm parameters will have no effect. This is intended to demonstrate the menu system only.
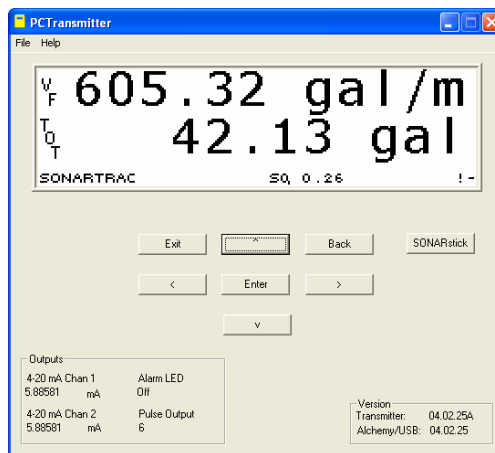
Figure 4   PC Transmitter

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		

H. Displaying Changes Made to Configuration Files

The transmitter configure screen has a 'Changes…' button that allows the user to view all changes made to the configuration file since the last 'Set Device Params' or 'Save As…' command. This is useful for keeping track of configuration file changes.
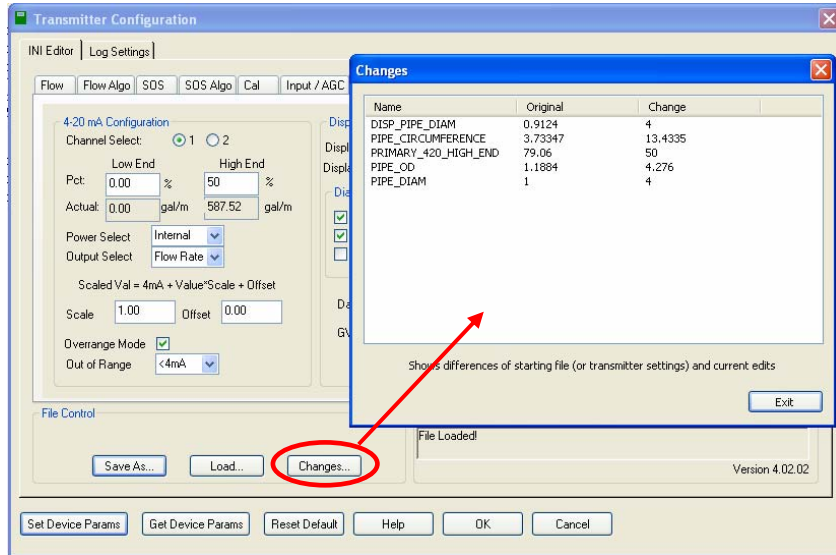

Figure 5   Tracking Configuration File Changes

The accompanying document, *SONARtrac® Hardware Changes V4.02.xx Features Firmware & Software Overview* prepared by the Embedded Systems Group contains additional information on these items and others as well. Read it as time permits.

Please contact Technical Support with any questions or comments.

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		

Document Change History

Date	Revision	Changed By	ECO #	Description of Change
11Feb08	01	Markoja	E09-0001	Initial release

Priority Code:			
1	Safety issue or system will not function	2	Intermittent problem causing system crash
3	Erratic data/readings	4	Added product feature
5	Product enhancement		