

ACE SRU Firmware V3.8 Upgrade.

NOTE:
***THIS FIRMWARE UPGRADE IS FOR THE
STANDARD SRU, NOT THE
SRU2/3/Spooler/Optix ENHANCED READOUTS***

New field installable firmware is available for the ACE Surface Readout Unit (SRU). F/W changes are listed below.

F/W Version 3.8

Corrects bug in hi resolution 32 bit Modbus registers for low temperature sensors.

F/W Version 3.7

Corrects overflow bug in hi resolution 32 bit Modbus registers.

F/W Version 3.6

Adds hi resolution 32 bit Modbus registers for all readings starting at 120 (same as SRU2/3/Optix/Spooler etc). The grc lo-res modbus mode emulation conflicts with the ACE Hi Res Modbus registers, so the supported mode may be toggled. See Factory (menu 24 options) below to change modes.

F/W Version 3.5

Adds Modbus registers 130-145 emulating a generic sps1500. Note accuracy, resolution etc is downgraded to match sps1500. Allows direct operation on GE Apollo VSD. If possible use normal ACE registers for more accuracy and channels.

F/W Version 3.4

Support for 10,000 PSI gauges.

F/W Version 3.3

Added Modbus register 97, downhole status, to match SRU2.

0 = OK, 1 = initializing, 2= open circuit, 3 = short circuit, 4 = error decoding such as wrong menu 9 setting.

F/W Version 3.2

Corrected timeout for bad packets on X (extreme temperature 350°F) series of sensors to prevent occasional loss of reading.

F/W Version 3.1

Added 500 PSI sensor selection..

F/W Version 3.0

Support for new extreme temperature 350°F units; 5X sensor selection added. Improved decoding under marginal conditions.

F/W Version 2.9

Hardware revision now shows as factory menu 24, selection 13 (2 is latest).

F/W Version 2.8

Improved 2 channel decoding.

F/W Version 2.7

38400 serial Modbus speed added. More accurate vibration scaling.

F/W Version 2.6

Improved 2 channel decoding.

F/W Version 2.5

2 channel wireline slim sensor support.

F/W Version 2.4

Corrected bug with decoding 6 channel sensors.

F/W Version 2.3

Improved accuracy for the winding temperature transducer, especially at elevated temperatures. Corrected bug that detects if winding temperature transducer is open circuit or partially shorted.

F/W Version 2.2

Support for 2 channel wireline systems.

F/W Version 2.1

Improved signal decoding under extremely noisy signal conditions, such as partial phase to ground shorts and also during heavy Modbus activity. Improved decoding for 6 channel downhole tools.

F/W Version 2.0

Corrected scrolling screen bug with more than 3 channel systems. Vibration decoding added.

F/W Version 1.9

Support for WG Smartguard emulation (see ACE manual V1.1 or later for details) and vibration added.

F/W Version 1.7

Support for the additional pressure ranges of ACE sensors. Improved factory SRU LED test (enter 1 at factory menu). Disconnected internal temperature sensor now reported as 1 Deg. F instead of 14.0 degrees. Support for iCON motor controllers.

F/W Version 1.6

Support for the new ACE dual sensor / discharge pressure option. Set channels (menu 9) to 4 and discharge pressure will show as channel 6.

Intake temperature is now displayed on the SRU up to 361°F (was limited to 302 °F on previous versions of SRU software). This allows higher display of temperature readings to support the new ACE-HT high temperature sensor.

Set Voltage (menu 10) bug corrected. If the SRU was left powered on driving a short circuit or phase to ground short it would attempt to automatically adjust the set Voltage. It was possible in some circumstances for the SRU to adjust and save the set Voltage to 0 causing the

SRU to not display readings once the short was removed. This bug has been corrected and the SRU will no longer save a value of zero.

New Modbus registers have been added for advanced factory operations.

F/W Version 1.5

In firmware version V1.4 and earlier it is possible for erroneous values to be shown for winding temperature readings. This will *only* happen under certain failure conditions, when the winding temperature transducer or the wires connecting it are partially, but not completely, open circuit. This could occur if the transducer connector has come loose, the transducer ground screw is loose, if the transducer or the connections to it have got so hot that it is melting, or if the transducer has been destroyed then subsequently contaminated with conductive fluid such as water. Version 1.5 of the firmware will correctly interpret this rare fault condition, and also provide extended winding temperature readings up to 600 Deg. F (which is outside of the transducers calibrated rating of 500 Deg F). A new value of 2.0 will be reported for the winding temperature if the transducer becomes partially open circuit. (Reported winding temperature of 0.0 indicates the transducer is shorted out, 1.0 means completely open circuit, 31.0 indicates between 0 Deg. F and 31.9 degrees F and now a value of 2.0 will be reported if it is partially open circuit).

. Display of high readings. It is now possible to view high readings of active channels. For example, when viewing intake pressure press the 'Enter' key and the display will change to show Hi xxxx where xxxx is the highest reading taken since the SRU was powered up. Pressing 'Enter' again will display He xxxx where xxxx is the highest ever recorded reading; this reading survives power fails. Pressing Enter again will restore the display to the current reading. The Hi reading may be reset either by cycling power to the SRU, or by using the test menus (Menu 24). To clear the Hi (highest) reading go to menu 24 (it will display 'Code'), press enter and change the value to 21 which will clear the Hi reading.

The highest ever reading may also be cleared, for example if the SRU was moved to another site or a pump and motor were to be re-run. It is suggested that this method remain confidential, as the stored high values may be required for pump/motor warranty claims. To erase the highest ever values proceed as follows. First go to the test menus (Menu 24). Enter the unlock key of 31, and the display will change to show "Un Lock". Without changing menus press 'Enter' again, and then enter the value of 22 which will cause all stored high settings to be cleared. Sixty seconds after the code page is unlocked it will revert to the 'Code' mode, after that entering 22 will have no effect.

Automatic Cycling of Readings. If none of the SRU keys have been pressed for 30 minutes it will start to cycle through all active channels approximately every 4 seconds, allowing operators to see all active channel readings without needing to press any buttons. As soon as any key is pressed the cycling will stop. Wait 30 minutes (or enter 23 in the test (Menu 24) screen to start cycling again.

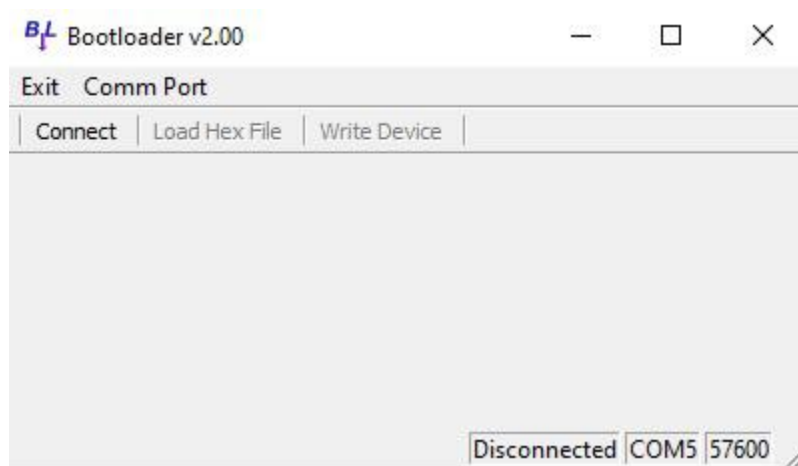
Procedure to Install New Firmware.

A PC with an RS-232 serial port or USB to RS-232 converter is required. **Note the f/w cannot be upgraded via RS-485.** Although not recommended, it is possible to upgrade the firmware on an SRU connected to a running pump and motor. (disable the VSD sensor comms shutdown to prevent the VSD shutting down due to loss of sensor comms). The ACE SRU serial port is optically isolated so there will be no electrical connection to the high Voltage or sensor, and power to the sensor will be removed during the upgrade process.

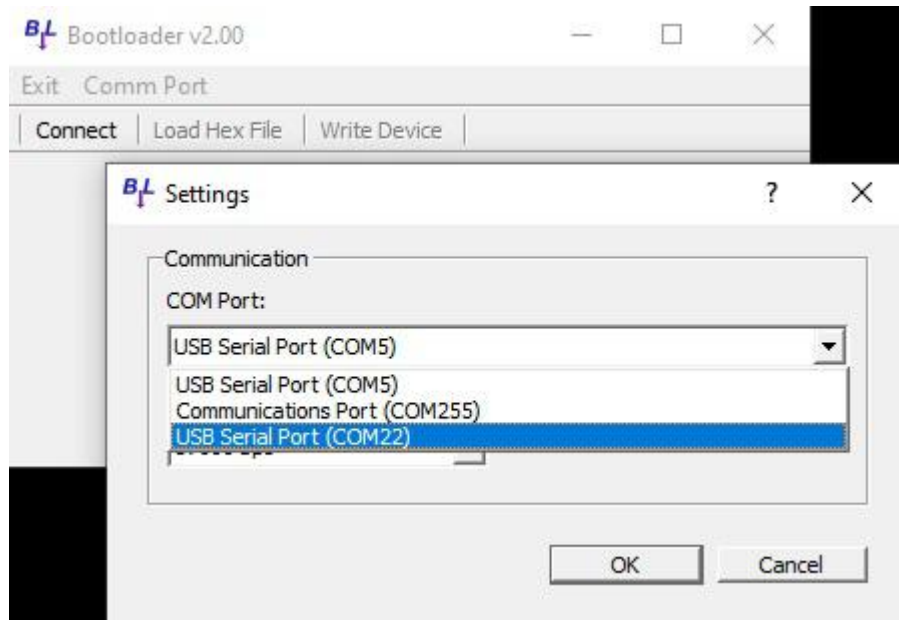
1. Download the zip file from www.acedownhole.com

Before unzipping the file right click on it look at the zip file properties and see if it has been 'blocked' by Windows; if so unblock it. If you don't do this the program will install with no warnings, but will not work and there will be no warning of the problem from Windows, which will prevent serial port access.

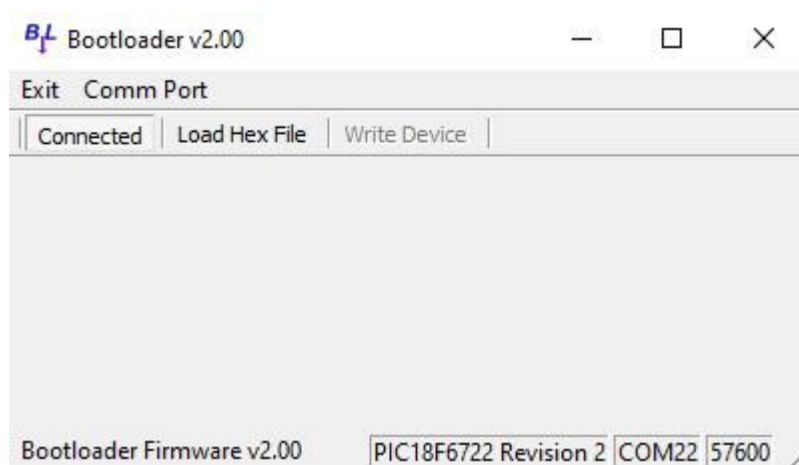
2. Unzip the file to a suitable directory on the PC hard drive. Plug in the USB/RS-232 converter that will be used and connect the serial cable to the SRU RS-232 connector.
3. Start the program marked bootloaderv2.exe Note, the program must be started in 'administrator mode'. A screen similar to this should appear:



4. If on, power the SRU unit off.
5. Place the SRU in bootloader mode. To do this hold down the ESC, DOWN and ENT keys at the same time on the SRU then apply power to the SRU. The two Rx and Tx LED's should flash, and the letter 'B' should scroll across the screen. You may need to try a couple of times to get this to work.
6. Click Comm Port to select the serial port that will be used to connect to the SRU.



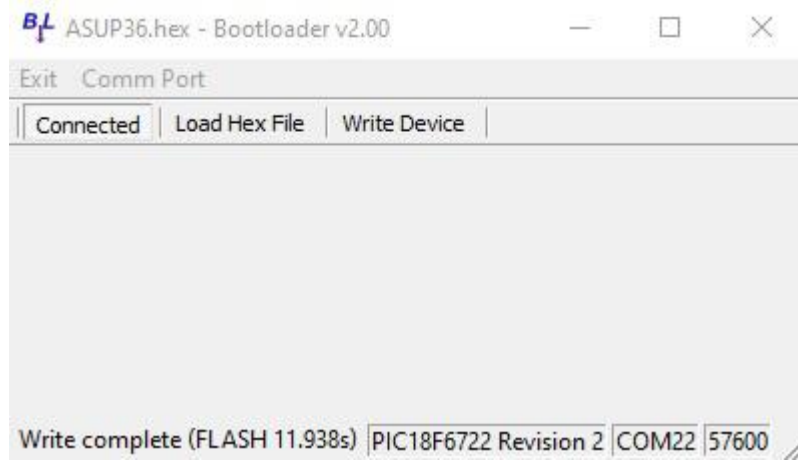
7. Click on the connect button and Information at the bottom of the screen should show connection status.



8. Click on "Load Hex File" to locate and open the new firmware, called SRU36.hex

9. Click on the "Write Device" button.

10. After a few seconds the status (at the bottom of the screen) should change to 'Write Complete'.



11. Power off the SRU and unplug the RS-232 cable.
12. Power up the SRU and the new F/W version 3.6 should flash on the screen. The update is complete, and all new features will become active.

Factory (Menu 24) Operations.

The following may be entered at the code (menu 24) menu.

1. Display test. Turns on all LED segments and comm. LED's.
2. Displays F/W version.
3. Shows packet time.
13. Shows hardware version.
14. Displays "Hi-Res" if current mode for Hi Res regs (120-136), or "grc" if grc low resolution sps mode registers are supported. See 24 for switching modes. See below.
20. Clears count of good and bad packets.
21. Clears history since power up.
22. Clears all history, including highest ever. The SRU must be unlocked first by entering 31 into the code menu.
23. Enables readings to start scrolling immediately (normally start scrolling after 30 minutes of no keys being pressed).
24. Toggles Hi-Res ACE Modbus registers or Low Res grc mode. See below
30. Enables test values. BE CAREFUL! This will start the SRU displaying ramping test values on the display and via Modbus polling, useful for setting up SCADA and controls in PLC's. **All readings of course are false.** The SRU has to be powered off and back on to exit this mode.
31. 'Unlock' key. This unlocks the SRU for 60 seconds to allow history clearing (enter 22 while unlocked).

In addition Alpha descriptions of menus may be toggled on and off by pressing the up and down keys at the same time.

Remember the latest firmware upgrade and manuals are available at www.acedownhole.com