

HydroCal Service Tool

**HCalServTool.exe**

1 General

HydroCal Service Tool (**HCalServTool.exe**) is a helper software for the dissolved gas-in-oil analyzer and transformer monitoring system HydroCal 100x.



It can be used to:

- Update the firmware and parameterization of a HydroCal 100x device
- Read out the service data, i.e. the configuration, parameterization and diagnostics data from a HydroCal 100x device

1.1 Quick Guide

This is a quick guide for use of the HydroCal Service Tool.

It describes the use of the tool in short form. Please refer to the full description following on the next pages, if more information on the use of the tool is needed.

- General Steps
 - Unpack the HydroCal Service Tool ZIP file to a directory of your choice
 - Connect HydroCal device either via serial cable (COMx) or Ethernet
 - Start *HCalServTool.exe*
 - Activate *COM ports* or *Ethernet* by clicking the button in the upper left corner of the *Communication Port Settings* frame ( / .
 - Either select
 - COMx in the combo-box labeled *Port:* or
 - Enter the Ethernet communication parameters into the edit fields *IP Address* and *Port Number*
 - Press the button *Device?* and wait for device detection to complete
- Update of Firmware
 - Commit the upcoming dialog and wait for updates to complete
- Optionally read out service data
 - To start the read out, the results of the latest DGA have to be entered. Fill the text fields with the DGA data or activate the corresponding check boxes. Chose a name and location for the result file.
 - The result file has to be send to the HydroCal service department for the purpose of error analysis
- Quit the application

2 Distribution / Installation

The HydroCal Service Tool is distributed in packed format (zip-file).

An installation is not required. Instead the software is just unpacked into a directory of the user's choice.

2.1 Prerequisites

To use HydroCal Service Tool, the following hard- and software requirements must be met:

- a personal computer (PC) running one of the Microsoft® Windows operation system with Windows 7 or later.
- either an Ethernet interface
(twisted pair copper wire with 100/10 MBit)
- or a RS232 / RS485 communication port
(internal RS232 or USB-to-RS232 or USB-to-RS485 device)

3 Operation

To carry out the standard task (firmware update, service data read out) using the HydroCal Service Tool, the following steps are required.

3.1 Connection and Start


The HydroCal 100x device must be connected via a serial cable to a free COM port of the PC. HydroCal devices with Ethernet interface are also reachable. Next the HydroCal Service Tool is launched by starting the executable file:

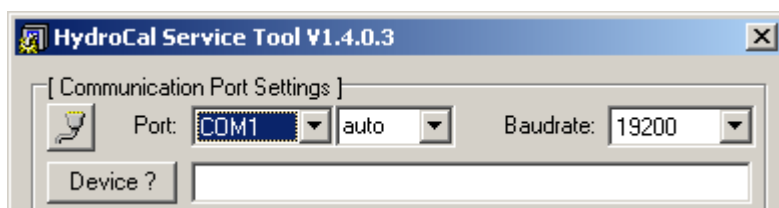


HCalServTool.exe


3.2 Interface Selection

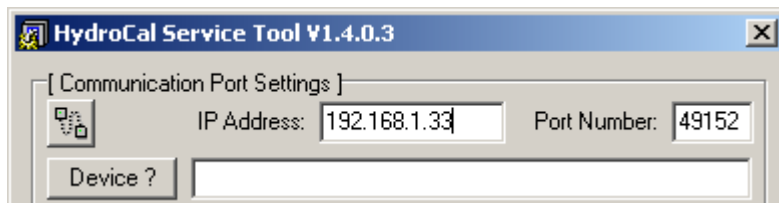
HydroCal devices may be connected via a serial port or via Ethernet. The button in the upper left corner of the *Communication Port Settings* frame allows toggling between the two.

-  For serial port connections the COM port and baudrate must be specified by the corresponding drop down list (*Port* and *Baudrate*). The type of serial interface (RS232 / RS485) can be selected by a drop down list attached to the right side of the *Port* drop down list - the default setting for the *type* drop down list is *auto*.



Remark for RS485: The *automatic* detection of RS232 / RS485 might not work. If it is known that the interface in use is a RS485, it is recommended to set the type box to RS485 manually.

-  If Ethernet is active, the *IP Address* and the *Port Number* have to be entered.
 - The IP Address depends on the network setup (fixed IP Address / DHCP).
 - The port number is entered during the HydroCal Ethernet device setup.



3.3 Device Detection

Prior to any other operation the connected device must be detected.

In the following screen shots the connection via serial line is active. The processing for Ethernet is similar.

To start the device detection, the COM port that the HydroCal device is connected to must be selected in the *Port:* combo box in the topmost frame (*Communication Port Setting*).

Remark: The baudrate must only be changed from the default of 19200, if the device has been re-configured to an alternate baudrate.

By clicking the button labeled *Device?*, the device detection processing begins. The following screen shots illustrate the steps.

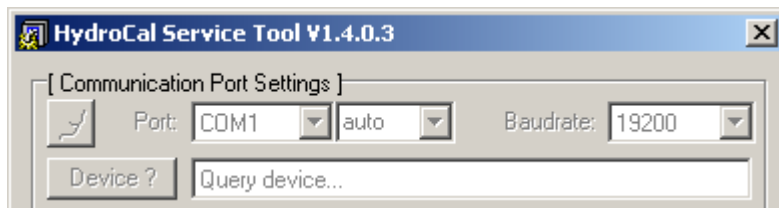
- Select COM port and baudrate



- Start device detection



- Execute device detection



- Device detected



After successful detection, the text field is filled with the device information consisting of:

- device name: *'Hydrocal'*
- serial number: *#99999*
- firmware version: *V1.00-B0000*

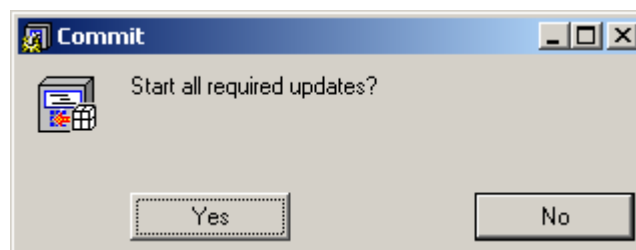
If the device can not be detected make sure that the settings for *Port* and *Baudrate* are correct and retry. If the device is connected via RS485 the auto-detect might not work and a manual configuration can help. The drop down list on the right of the port drop down list allows the following selections:

- auto Do an automatic detection of RS232 / RS485.
- RS232 Fixed setting to RS232.
- RS485 Fixed setting to RS485.
- rs485 RS485 was auto detected.
(When Port is changed a fall back to auto is done.)

For Ethernet verify the IP Address (try to PING the device) and check the port number.

3.4 Firmware and Parameter Update

Along with the device detection there is also a check for required firmware updates. The *Automatic Update* dialog appears, asking whether all required updates should be downloaded to the device.

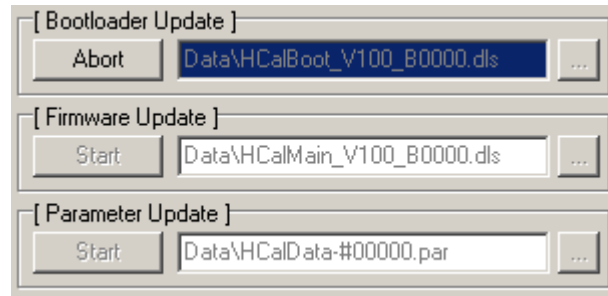


Committing this dialog with Yes will start the download of the required updates in automatic mode.

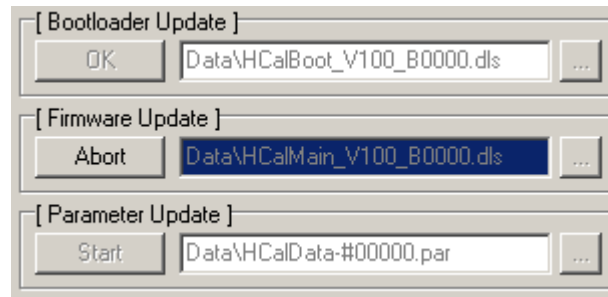
3.4.1 Automatic Update

In automatic update mode, the updates will be downloaded from top to bottom (boot loader, firmware, parameter) as required. The following screen shots illustrate the processing.

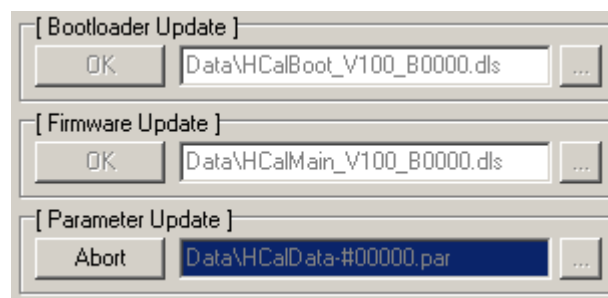
- Update bootloader



- Update firmware



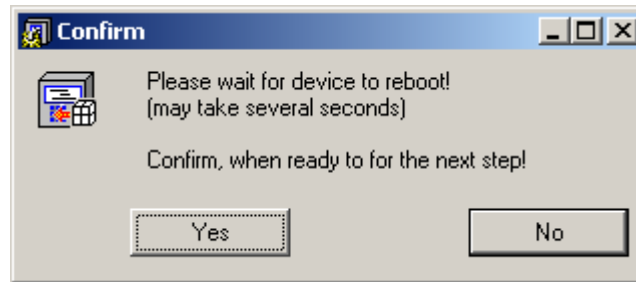
- Update parameter



The bar and the text box in the bottom area of the application window will indicate the progress and show messages.

3.4.1.1 Update via TCP / IP

When the update is carried out via a network connection (TCP/IP) the user must manually commit the update steps.



It may take some time (several seconds or even minutes) until the device is reachable again. The time is the sum of the time it takes to transfer the firmware, to write the firmware, the time to reboot and the time it takes to bring back the network connection into operation.

For a local network connection a minimum time of ~30 seconds can be presumed.

Remark: The service tool cannot track the status of the update as the connection is closed once the firmware is transmitted.

3.4.1.2 Update of Hydrocal HC1001 via TCP / IP

If a network point-to-point connection is used and the *communication interface reset* was executed to temporarily set a fixed IP address on the device, the *communication interface reset* must be executed again after every download step.

After completion of a download step a reboot of the device occurs and the device will restart with configured network setup - so commonly the TCP/IP configuration will not match after the reset and the communication will not work.

3.4.2 Manual Update

If the *Automatic Update* dialog is canceled (*No* button, *ESC* key), the updates can be skipped at all or they can be downloaded in manual mode.

3.4.3 Parameter Update

If the HydroCal Service Tool package contains a parameter update, this update will always be marked as missing because there is no versioning of the parameter (as it is the case with the bootloader / firmware).

Once the download of all updates has been executed successfully, there is no need to update the parameters again, even if the *Automatic Update* dialog appears again after a repeated detection of the same device. Nonetheless it does not harm to update the parameters twice.

3.5 Service Data Read

Besides the update of the bootloader, firmware and parameterization the second main task of the HydroCal Service Tool is the read out of the configuration, parameterization and diagnostics data from a HydroCal 100x device.

3.5.1 Latest DGA Results

In order to perform a service data read it is required to fill in the results of the latest DGA (Dissolved Gas Analysis) of the laboratory in charge. Depending on the Hydrocal device type a different number of reference gases may be required.

Either the analysis results have to be entered to the text fields or the corresponding checkbox, indicating that the information is not available, must be marked.

[Service Data Read]

Latest DGA Results

Date (yyyy-mm-dd): 2011-04-15 ☐ Unknown ?

H2 [ppm]: 13 ☐ ?

CO [ppm]: 347 ☐ ?

Oil Temp. [°C]: 35 ☐ ?

Humidity [ppm]: --- ☒ ?

Start

Example Hydrocal 1003

[Service Data Read]

Latest DGA Results

Date (yyyy-mm-dd): 2011-04-15 ☐ Unknown ?

C2H2 [ppm]: 10 ☐ ?

C2H4 [ppm]: 34 ☐ ?

C2H6 [ppm]: 23 ☐ ?

CH4 [ppm]: 18 ☐ ?

H2 [ppm]: 54 ☐ ?

CO [ppm]: 234 ☐ ?

Oil Temp. [°C]: 37 ☐ ?

Humidity [ppm]: 11 ☐ ?

Start

Example Hydrocal HC1001

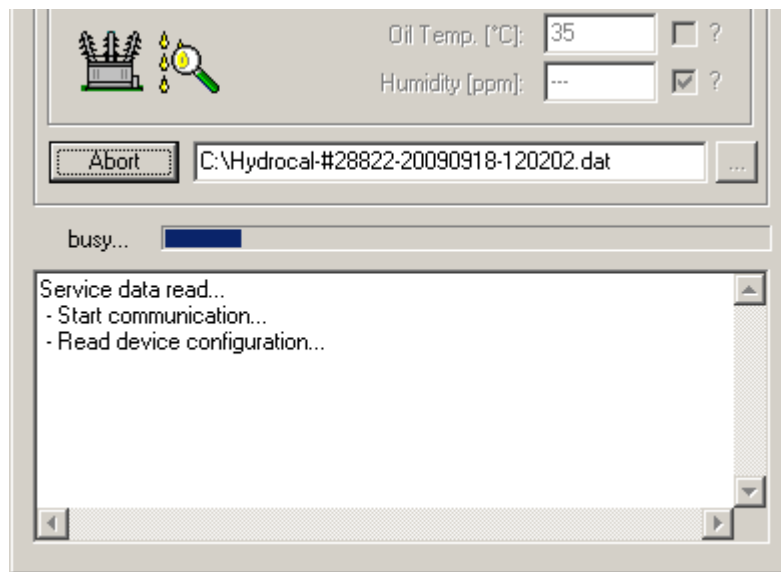
The next step is to select a file to store the data ('...' -Button). In the standard configuration a default file name is generated consisting of the device name, serial number and the date and time of the read out. The default directory for the file is the user's home directory.

A file selection dialog appears allowing the user to accept the default name and directory or to choose a new name and / or location.

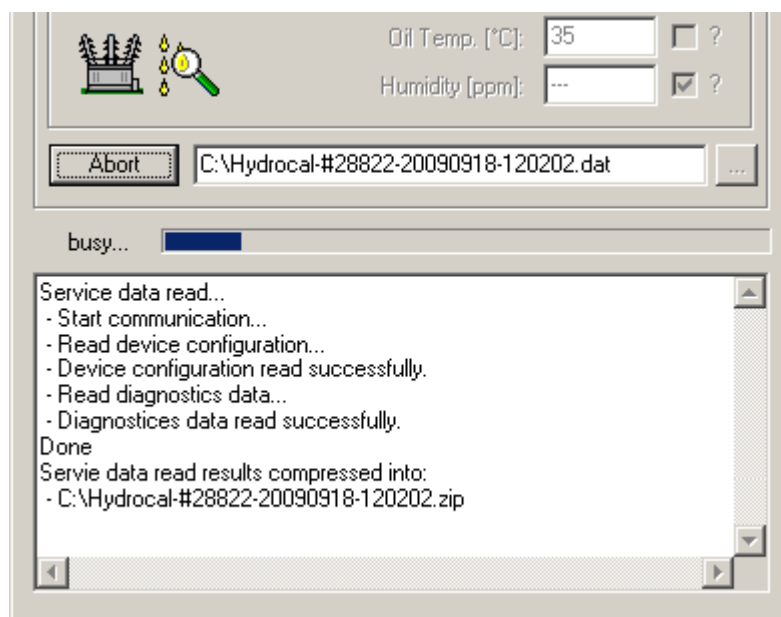
3.5.2 Execution of Service Data Read

Pressing the *Start* button launches the service data read that will consist of the following two main steps:

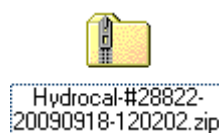
- read of device configuration



- read of diagnosis data



At the end of the service data read the result file is compressed (zip) and the uncompressed file is deleted. The compressed result file will have the same name as the uncompressed result file but with extension .zip.



For the purpose of error analysis please send the compressed file via email to the HydroCal service department.

Revision History

- V1.0.0.0 Initial revision
- V1.0.0.1 Less CPU load; faster diagnosis data download
- V1.0.0.2 Bug fix release - fast diagnosis data download stuck (devices with modem only)
- V1.0.0.3 Bug fix release - no device detection with new firmware (V1.00-B1000)
- V1.0.0.4 Internal release
- V1.0.0.5 Internal release
- V1.0.0.6 Bug fix release - Full support for device with non-default baudrate setup (\neq 19200) and modem
- V1.1.0.0 Ethernet Support; Hydrocal HC1005 Support
Download of diagnosis data via Ethernet (for Hydrocal 1002/3, HC1005)
Update of firmware via Ethernet (HC1005)
- V1.1.0.1 Bug fix release - HC1005 not detected in serial update
- V1.2.0.1 Support HC1008, improved TCP Firmware update error messages
- V1.2.0.2 Extended diagnostics data readout for HC1005, HC1008
- V1.2.0.3 Bug fix release - Fix lost data when downloading diagnostics data via TCP
- V1.3.0.0 HydroCal HC1001 Support with update via RS485
Support for RTS controlled data flow and drop off transmission echo.
- V1.3.0.1 Version check for boot loader for HC1001/5/8 integrated.
- V1.3.0.2 Support for sending background commands in parameter files.
- V1.3.0.3 Bug-fix for RTS control. HydroCal devices with active modem could not detected
(Bug was introduced with V1.3.0.0).
- V1.3.0.4 Bug-fix for HC1001 - Fix ghost warning when reading diagnostics data.
- V1.3.0.5 Bug-fix for reading diagnostics data
- V1.3.0.6 Increase of internal timeout (fix reading diagnostics data for HC1001)
- V1.3.0.7 Fix for firmware update when device has a fixed baud modem (IP, DNP3)
- V1.3.0.8 Fix for firmware update via TCP (TFTP)
- V1.3.0.9 Fix for Windows 7 and PC without a serial port
- V1.3.0.11 DGA Adjustment input requirements fixed for Hydrocal HC1008, HC1001, HydroTEC 1001+
- V1.3.0.12 Configurable timeout for read of diagnostics data streams
- V1.4.0.0 Firmware download via TCP - Fix problem with extraction chamber being locked in current status
- V1.4.0.1 Firmware download via TCP - Fix download error when symbolic host name was used
- V1.4.0.2 New help dialog to start service data read, when no updates required.
- V1.4.0.3 Added a new drop down list to select kind of serial port (auto / RS232 / RS485).
- V1.4.0.4 Internal release
- V1.4.0.5 Bug fix for extraction chamber stop (firmware download via TCP). Support for *.HCC file download.
- V1.4.0.6 Bug fix: Service data read via IP-Modem on a Hydrocal 1002/3 changed modem baud rate - no further communication via IP modem possible.
- V1.4.0.7 Internal operation changed to work around problems when reading a Hydrocal 1002/3 with IP2 modem.
- V1.5.0.0 New: Basic support for HydroTAP. Fix: Allow slow baudrates (<19200).
- V1.5.0.1 Bug-Fix HydroTAP: Debug info was not read.
- V1.5.0.2 Fix: Bootloader update detection Hydrocal HC1005/8 (always did update).
Fix: Bad version info in service data (no re-read after manually triggered updates).
- V1.5.0.3 New: Read extraction fault settings for Hydrocal HC1005/8.
- V2.0.0.0 Fix: Scaling problem with non-standard Windows screen resolution settings.
New: Add service tool version information to output file.
- V2.1.0.0 New: Support for Hydrocal HC1009.
- V2.1.1.0 Bug-Fix: Support for Hydrocal HC1009.
- V2.1.2.0 Fix: Use Save-Dialog for selection of service data file; Update internal defaults to assure read-out of extraction logging data; Support for *.HCC files in file selection dialogs.
- V2.2.0.0 New: Support for Hydrocal HC1004genX.
- V2.3.0.0 New: Support for Login.
- V2.3.1.0 New: Limit depth of history data. Allow chunked transmission of history data.
- V2.3.2.0 New: Allow chunked transmission of other diagnostics data. Bug-Fix: Chunked transmission.
- V2.3.3.0 Bug-Fix: Chunked transmission.
- V2.3.4.0 Bug-Fix: Limited depth of history data (selection of all data only read current day).
- V2.3.5.0 OEM Support (no functional changes)
- V2.3.6.0 Bug-Fix: Error after detection of an HC1004genX (arbitrary activation of DGA reference gases).
- V2.3.7.0 Fix: Read diagnostics log for HC1004genX.
- V2.4.0.0 New: 2-stage-update for new firmware Hydrocal HC1005/8/9
- V2.5.0.0 OEM Support (no functional changes)
- V2.6.0.0 OEM Support (no functional changes)
- V2.7.0.0 New: Support TFTP port unlocking