

SI_Convert rescues orienteering results

Lennart Almström
Version 2.2, 23 Sep 2024

Note: This is an automatic translation by Google Translate of the Swedish instruction document.

Content

Revisions	2
Overview	3
Installation	3
Delivery	3
The file SI_Convert.zip	3
The Convert.cfg configuration file	3
Modified view of ErrA after conversation with Peter Löfås	4
The log file Convert.log	5
Carry out the rescue work	6
Step 1: Run Read_SI_units.bat	6
Check the contents of Adjustments.xlsx	7
Step 2: Run Join_files.bat	8
Make any adjustments in the file Totalsort.csv	8
Step 3: Run Get_Starttimes.bat if drawn start times exist	9
Step 4: Prepare the MeOS backup file that will be used as the basis for restoring the race result in MeOS	9
Step 5: Run Create_Readout_file.bat	10
Make any adjustments in the file Readout.csv	10
Step 6: Recreate the competition result in MeOS	10
Use of step 1 only to extract statistics	12
The art of getting a safer Voltage value	13
Technical information about the program that you do not need to read to use it	14

Revisions

	Date	Description
0	2024-01-05	Document created.
1	2024-01-07	Corrections and clarifications after Torbjörn Wikström's proofreading.
2	2024-01-15	Support for competition spanning multiple days and correct handling of time adjustment large enough to change dates. Default value of SI_turnoff in configuration file changed to Yes .
3	02/02/2024	Modified view of the handling of ErrA after contacts with Peter Löfås . Addition of a chapter with technical information about the program.
4	2024-03-08	Changed formatting.
Version 2.0	2024-05-26	Support for lottery start times.
Version 2.1	2024-08-23	Manage competition with direct entry only.
Version 2.2	2024-09-23	Allow selective loading and result generation if correct backup up to certain time exists.

Overview

SI_Convert can save the results of an orienteering competition with SI controllers when the reading of the SI pins has failed for some reason.

This is done by reading the information in all the control units in the forest plus the start and target units and converting it to the format that a backup file from the reading unit gives off.

The conversion is done incrementally so that manual interventions can be made along the way, which is usually required to achieve a correct result.

The first step, to read the information from all the SI units, can also be used separately to get information about all the SI units read, since a lot of information is collected and presented in an Excel sheet.

Installation

Delivery

The installation file for the program SI_Convert can be obtained from me, email lennart.almstrom@telia.com.

The SI_Convert.zip file

- Download the file SI_Convert.zip to any directory, for example Documents .
- Right-click the downloaded file and select Extract all.
- In the box that appears, press Browse and select your Documents directory .
- Then press Extract .
- The directory SI_Convert will be created as a subdirectory of Documents .
- If you want, you can now delete the downloaded file SI_Convert.zip, it is no longer needed.

In the following, all files needed will be in or created in the SI_Convert directory , so unless otherwise stated in the following, look for all files there.

Convert.cfg configuration file

Convert.cfg is a configuration file for the program, where you can change a number of properties.

Normally you don't need to change anything, but it might be good to know about the following possibilities:

- [window] Lines and Columns specify the size of the black box (Command Line Window), where you communicate with the program. It may be useful to adapt it to your screen size to accommodate displayed lines without splitting them into multiple lines.

- [Actions] SI_turnoff controls whether the SI devices should be turned off automatically after they have been read. The default value is Yes , but you can change it to No if you want the devices to be left powered on before you intend to do something more with them.
- [Actions] Correct_times gives the possibility to automatically change loaded stamping times per unit, in case the time has not been set correctly in some units before the competition. If so, change the value to Yes and follow later instructions to get intended changes.
- [Actions] Approve_ErrA gives the possibility to approve stampings that have been done too quickly so that the SI unit has not had time to register the stamping in the SI stick yet, but it is registered in the SI unit, however without the timing of the stamping. These stampings had not been approved in the normal reading of the SI pin after the finish, so they should not normally be approved now either. But if you want to be nice, for example during a training session, you can choose to approve these stamps. The runner has evidently been at the control. In that case, change the value to Yes . ATTENTION! See also the following section where I have added new views on how ErrA should be handled.

You make changes by opening the file in Notepad or Wordpad , making your changes and saving it. Don't use Word to make changes to it, Word likes to add extra formatting information, which means the file won't work afterwards.

Modified view of ErrA after conversation with Peter Löfås

I discovered some oddities connected to ErrA at our test races. Runners who had been cleared at the race were given ErrA on the replay or were not found at all in the data from the controller. Peter Löfås has previously (2018) documented that the control unit notes ErrA if it has only identified the ID of the SI pin, but has not had time to write the stamp back to the SI pin until the runner has removed it. I therefore contacted Peter Löfås to get his views.

He pointed out that the control units' handling of modern SI sticks with built-in displays has changed, so that they now write back the stamping to the SI stick directly and only then read the number on the SI stick. If the runner then removes the SI stick before the control unit has had time to read the number, there is no trace of the stamping in the control unit even though the registration is correct in the SI stick. Should the control unit manage to read the number on the SI stick, but has not had time to acknowledge it until the runner removed the SI stick, the control unit notes ErrA instead of the stamping time.

For older SI pins without a built-in display, it still works according to Peter Löfås's previous documentation, so if the controller has noted ErrA , then there is no registration in the SI pin.

So the bottom line is that with modern SI pegs and runners quick to pull them out of the control unit, it is impossible to fully recreate a correct race result with this program. Since most runners have not made this mistake, the result for the vast majority of runners will still be correct.

According to experience from the test race, most of these errors result in the control unit still having time to register ErrA , so that there is a record that the runner has been at the control, but without any time.

Therefore, if one chooses to accept ErrA registrations, MeOS will read them in but fail the runner because it looks like he has stamped at the check at 00:00:00 and therefore the checks have been taken in the wrong order.

If you want to approve the runner, you must therefore, after loading in MeOS, go to Participant - Form mode and manually enter a stamp at the control with a fake time that means that the controls have been taken in the correct order.

The Convert.log log file

Should any error occur during the runs, error information will be logged in the Convert.log file.

After all, the program has been subjected to a limited amount of tests, so there may certainly be residual errors. In that case, please report to me (lennart.almstrom@telia.com), send the log file and describe in what context the error occurred.

Carry out the rescue work

In the SI_Convert directory, there are four BAT files to be used in the recovery work:

- Read_SI_units.bat: Retrieves information about all SI units used during the race, including start and finish units.
- Join_files.bat: Collects information from all files in the Punches subdirectory , performs any corrections to punching times, and creates a sorted file as the basis for creating the final result file.
- Get_Starttimes.bat: If fixed lottery start times are used, it converts the start times from Eventor to an excel sheet Starttimes.xlsx, so that the created stamp file can be supplemented with the fixed start times.
- Create_Readout_file.bat: Creates the Readout.csv file which can then be read into MeOS or other results program to recreate the race results.

Step 1: Run Read SI units.bat

- Connect an SI reading unit to the computer and insert a programming stick into it to be able to read all the SI units in turn.
- Start the first SI unit to be read using the Service-off pin and place it on the reading unit. It does not matter in which order you read the SI units, but to keep order that all are read, it can be an advantage to take them in numerical order.
- Start the loading program by double-clicking on the Read_SI_units.bat file.
- A question appears in the Windows window : “Is this the first control unit read session for this competition? (y/n)”: Answer y and press Enter as this is the first run.
- The following appears in the window : "Press <Enter> to read next remote station, or q to quit:". Respond by pressing Enter to read the first SI unit.
- If everything goes well, it will be indicated by the prints in the window. It also reports how many stamps have been read in from the unit. It sometimes happens (I have not been able to find out why) that the loading fails without giving an error indication. Then you will also be prompted to check whether the device has been used during the competition and that, if so, it should be read again.
- Remove the SI unit from the readout unit and stop it with the Service-Off pin, in case you have not requested automatic shutdown (see earlier about Convert.cfg).
- Start the next SI unit, place it on the reading unit and press Enter again to repeat the procedure.
- Continue in this way until all SI units used, including the start and target units, have been loaded. If you want, you can also read in the empty and check units. They are not used to obtain the result, but the information will be transferred to MeOS , so that the stamps are reported there

A few notes to keep in mind when loading:

- Read_SI_units.bat can be rerun any number of times to supplement with additional SI units or load a unit again if there were problems with the first load. Just make sure to answer n to the question if it's the first round of loading when overtaking. Each time you answer y, all previously loaded information will be deleted and you will have to restart all loading from the beginning.
- If you are not sure if a device has already been loaded, there is no problem to load it again, any previous loading is just replaced by the new one.
- If multiple SI units have been used in the same check, just read them all in.
- A common problem when reading in is that there is no contact with the reading unit. Then it may help to disconnect it from the computer and connect it again. It may also help to remove the running SI from the readout, stop it, and start it again before putting it back on the readout.
- The information about all loaded SI units is stored in the Excel file Adjustments.xlsx and the punches per unit are stored as separate files in the Punches subdirectory .
- You can open Adjustments.xlsx at any time to check what has been loaded and what properties the loaded entities have. Just remember to close the excel sheet again before resuming the loading, otherwise the loading program will not be able to update the excel sheet.
- If touch- free stamping has been used at the competition, it is not possible to reconstruct the result using this method, because the touch- free stampings are not recorded in the SI units. However, it is possible to use this method to restore the result for those who have applied regular stamping, even though the SI units have been enabled for touch- free .

[Check the contents of Adjustments.xlsx](#)

The Excel sheet Adjustments.xlsx has two tabs Statistics and Complate (see at the bottom of the excel sheet).

Statistics tab is the one that appears initially and contains all the statistics about the loaded SI units. Here you can check that all used devices have been loaded and that everything seems OK.

Among other things, you can see if the devices' time errors seem reasonable. The time in all SI units drifts a bit randomly so if the reading is done several days after the race it is reasonable that there is an error of a few seconds.

Should there be a large timing error on any device, the time was probably not set correctly in it before the race and it may be good to have the program adjust the timing of the stamps on that device.

Then you can delete the values in Time The Error column except in the row for the unit for which you want to correct the time. Then you activate the time correction in the file Convert.cfg (see description earlier). Then the times for that unit will be corrected in the next step. If you have a

better proposal for the size of the time correction, it is fine to change the error time in the excel sheet. The value can be positive or negative. A positive value means that the clock is ahead and will therefore be corrected backwards in time, a negative value the opposite.

Should you have missed setting the correct time for all the units so that they have very variable error times , it may be reasonable to let the program adjust all the times.

If you have made changes to Adjustments.xlsx and then regret it, the file Adjustments_backup.xlsx contains the original values.

Then go to the Comdate tab by clicking on that tab.

It contains two values, the from and to date when the competition took place. The value has been taken from the last stamp on the first device loaded and set in both fields.

Should they not show the correct competition day, or if the competition spans several days, you will need to change to the correct dates, as the program will only load stamps made within the specified date range.

Step 2: Run Join_files.bat

- Double-click the Join_files.bat file to run step 2 of the results rescue.
- If you have turned on the time correction in Convert.cfg, you will get a question “ Should hours corrections ... be applied ?”. If you answer y, time corrections according to the contents of Adjustments.xlsx will be performed. If you answer n instead, the time corrections will be skipped even if you have activated them.
- The contents of Adjustments.xlsx will then be displayed and you will be asked to confirm that it is correct.
- If you have turned on the option to approve stamps with the error ErrA , another question will appear where you have to confirm that you really want it.
- When the questions are answered, a Totalsort.csv file is created which contains a row for each stamp made, sorted by participant (ie SportIdent id) and (possibly corrected) stamp time. That file is then the basis for creating a reading file in step 3.

Make any adjustments in the Totalsort.csv file

Should it be the case that there are stamps that should not be included in Totalsort.csv, it is possible to open the file in Excel or a similar spreadsheet program and make manual corrections, above all to remove stamps that should not be included.

It can be the control subjects' stampings or stampings that have been made on the correct day, but belong to another competition where the same controls have been used.

If not too many corrections are needed, they can also be made in the Readout.csv file after step 3 or in MeOS after loading there, but as soon as there are stamps that have not been made by registered participants of the competition, the loading in MeOS becomes more cumbersome .

To get it right when the csv file is saved again after the corrections, make sure that the semicolon is specified as the only separator character when loading.

Some explanations for the columns:

- SIID is SportIdent Id
- Control time is the (uncorrected) time of the stamping
- Code number is the SI unit number
- Punch DateTime is the (possibly corrected) time of the punch
- Operating mode is the functional type of the SI unit

Step 3 : Run Get_Starttimes .bat if drawn start times exist

If the event has fixed drawn start times for some or all classes, so that the runners in those classes do not start, the start times must be retrieved from Eventor.

Do this:

- Export the startup time file from Eventor. Store it in the SI_Convert directory where the other files are located and name it "startlist.xml".
- Double-click the Get_Starttimes.bat file to run step 3 of the results rescue.
- The Excel sheet Starttimes.xlsx will be created.
- Open and possibly adjust the contents of the excel sheet . It could be the case, for example, that start times have been changed afterwards or new participants have been added who are not on the start list. The only columns that need to be changed are the first two, SI Number and Start Time . Other columns are only to facilitate the possible manual adjustment.
- If the excel sheet has been changed, save it again.
- The Excel sheet will be read in in step 4 and supplemented with start times for the SI IDs included in the sheet. The start times will be entered unconditionally, so if a runner in a drawn class has been allowed to start, for example due to confusion in the start procedure, then the line with his drawn start time must be removed from the excel sheet .

Step 4 : Prepare the MeOS backup file that will be used as the basis for recreating the race results in MeOS

- Here, only what must be done if MeOS is used as a competition system is covered. If you use another results program, you can adapt the handling to it.
- Hopefully, you've used the automatic backup in MeOS so that you have a backup fairly close to the time when the data management has crashed for some reason. Personally, I usually run the machine with an interval of 1 minute. It doesn't bother anything because the backup is fast and each time creates a file that is not very large. I also make sure to put the backups on a USB stick so that I am protected in the event of a total disk failure on the computer.
- The older your most recent security backup is, the more problems you will have with manual re-registration of the most recently directly registered runners.

- Should you have no backup at all, you may recreate the competition manually, possibly from the very beginning and re-enter the participant registrations. If you have a backup, proceed as below.
- Copy your latest security backup (however you made it) to the SI_Convert directory . Rename the copy in the SI_Convert directory to lastbackup.meosxml .
- If your chosen backup has been taken during the competition and finishes and readouts have already taken place, you can choose to keep the results that have already been recorded. In this way, you do not risk that these participants may suffer from the ErrA problems that, from experience, can arise when the result is restored from the units in the forest.
- If you want to keep the already registered results, do not perform the next point (Clean_MeOS_Backup).
- **Perform this point only if you need or want to restore all results:**
Double-click the Clean_MeOS_Backup.bat file to remove all recorded results from the lastbackup.meosxml file and create a new backup file lastbackup_cleaned.meosxml .
- (If you have performed the above point and regret it and instead want to keep already recorded results: Delete the file lastbackup_cleaned.meosxml .)

Step 5 : Run Create_Readout_file.bat

- Double-click the file Create_Readout_file.bat to run step 4 of the result rescue.
- If in the previous step you chose to keep already registered competition results and therefore did not create the lastbackup_cleaned.meosxml file , only the results that are not already in the lastbackup.meosxml file will be included.
- The run creates the file Readout.csv which is the file to be read into MeOS or other results software to reproduce the results of the competition.

Make any adjustments in the Readout.csv file

It is also possible to make manual adjustments to the Readout.csv file before it is loaded into MeOS , by opening it in Excel in the same way as described above for Totalsort.csv.

Readout.csv contains a long row for each participant, so deleting some participants may be easier to do in this file.

Step 6 : Recreate the race result in MeOS

- Here only what is to be done in MeOS is covered . If you use another results program, you can adapt the handling to it.
- If you have run the Clean_MeOS_Backup.bat procedure in step 4, you should now import the backup file lastbackup_cleaned.meosxml as a new race to MeOS . If you did not run it,

the lastbackup.meosxml backup file will be imported instead. You do the import by pressing Import competition... on the initial page of MeOS .

- When the import of the race is complete, select the Sportident tab , make sure the Readout/Radio times function is selected, uncheck Interactive loading and check Use runner database (if you have loaded it).
- Then select Import from File ... and select the Readout.csv file created in Step 5.
- Select Save if you are satisfied with the participants displayed.
- MeOS generally fails to match all runners with the results. You can find those that MeOS has failed by selecting the Participants tab and under that Manage Tiles. Participants that need to be managed manually have been named Unpaired. Double-click on those with the name Unpaired, and you will get a menu where you can link the SI stick to the runner the stick belongs to.
- Please note that there may be some runners that should not be paired, eg checkers who have proof stamped the checks. They are included now because we have read in all the stampings that have occurred in any control.
- Then make any further adjustments that may be needed. Mark, for example, No start on the registered participants who have not received any results.
- If you have decided to approve stampings that have received ErrA , then these runners must be handled as previously discussed in the section " Modified view of ErrA after conversation with Peter Löfås" on the page 4.
- If you need to redo the load into MeOS , for example because you've had to redo previous steps to make further adjustments, it's generally easier to re-import the MeOS backup as a new contest and start over from there. There will be a lot of stops for manual handling if you read in the results one more time in the same competition.

It is no problem to rerun previous steps in the reconstruction several times when you have changed the conditions, if you discover , for example, that you need to adjust the time corrections. The program does not know in which order the runner has taken the controls, but places the stamps in corrected time order. Incorrect timing corrections can cause the checks to appear to have been taken in the wrong order, so the corrections need to be changed. Since the time corrections take place in step 2, you only need to rerun from there, without reading in all the SI units again.

Using step 1 only to extract statistics

The first step to read in the SI units can also be used separately just as a simple and quick way to retrieve information about the units.

Any type of device that can be read with a reader and a programming stick can be read, even if they are not of a type that records stamps.

The data that is read from the device and reported in Adjustments.xlsx is:

Control	Device number	Normally 31-511 for controls, 1 – 30 for other functions. Some SIAC functions, such as SIAC off, have no number and are reported as 0.
Fashion	The function name of the device	If the function name begins with Bc, the device is set for touch- free stamping (Beacon mode). Other names are hopefully self-explanatory.
Serial	The serial number	Sat at the manufacturing.
Time error	How much the clock goes wrong	A positive value means that the clock in the device runs ahead of the correct time, a negative means that it runs behind. Note the period between seconds and milliseconds (not commas). If the error is greater than 60 seconds, minutes and possibly hours are reported with a colon between them.
Voltage	The battery voltage in volts	This is the most important value to assess the health of the device. If the value is below 3.00 V, the device emits an extra beep to alert you when you turn it on. It is the indication that the battery should be replaced as soon as possible. However, it can generally handle another period of use.
Active time	How many minutes it takes for the device to turn off after inactivity	In the context of training, the time can be short to save the battery. The only thing that happens on a new stamp after the device has shut down is that the first stamp takes a fraction of a second longer, because the device has to start up first.
Capacity	The battery's energy content in mAh when it was installed	This value should be set by the person replacing the battery according to the capacity indicated on the new battery, but it is sometimes forgotten or set incorrectly.
Firmware	Software version in the device	The newest version has for a long time been 656 (at the end of the year 2023).
Battery date	The date the battery was last changed	This value must also be set by the person who replaces the battery and is therefore only correct if the battery has been replaced correctly. Initially, the value is = Build date.

Battery %	Remaining battery capacity in percent	This is a value that is probably calculated by the device from the total time the device has been running since the last battery change. The value is generally considered very uncertain. It is the Voltage value that you should primarily use to determine whether the battery should be replaced.
Build date	Date the device was manufactured	Set by Sportident from the beginning and never changed.
Modification date	Last date and time when any change to the settings in the device was made	SIConfig + or an SI Master sets this value when the settings in the device are changed.
Last punch date	Last date and time when a stamp was made on the device (the data disappears when the device is emptied)	If stampings exist, the time of the last stamping is reported.

The art of getting a safer Voltage value

When a device has just been turned on, the Voltage value can vary quite a bit. To get a safer value, the unit should therefore have been running for a while, the longer the safer value. I have seen recommendations as long as 2 hours.

In order for the device not to turn off automatically, when intending to leave it on for a while to stabilize the Voltage value, it should be started with a normal SI pin, not the Service-off pin. When a device is started in Service mode with the Service-off pin, it automatically shuts down after 10 minutes of inactivity. This is done because the Service mode mode takes significantly more power than the normal mode.

(When taking the reading of units to reproduce a competition result, one should not use a standard SI pin, as it causes an extra stamping in the unit. Instead, use the Service-off pin to start the unit, as indicated in the previous section on loading.)

A good idea when a series of units is to be measured is to start all the units first with a normal SI stick and then start the measurement only after another while (as long as you have the desire and patience to wait). In any event, the value will be safer than if you measure directly after starting each unit.

If you also activate in Convert.cfg the function to turn off the SI units automatically after loading, then you only need to enter the SI units one by one and press Enter on the screen to measure a whole series of units.

If you want to save the statistics, you can just rename Adjustments.xlsx to a different name or save it under a different name. On the next run, a new Adjustments.xlsx file will be created.

Technically about the program you don't need to read to use it

The tests of the program have been done in Windows 10, but it should work in all modern Windows versions.

The program is delivered as a zip file , which when installed as above expands into a directory SI_Convert , which contains a number of bat files to run the various steps and two subdirectories lib and Punches .

SI_Convert directory contains the source code for the program and this documentation in pdf format .

The program is written in Python version 3 and compiled into an exe file Convert.exe, which uses a large runtime library found in the lib subdirectory.

For reading the SI controls, the module sireader is used , which has the following copyright:

```
# Copyright (C) 2008- 2014 Gaudenz Steinlin <gaudenz@durcheinandertal.ch>
# 2014 Simon Harston <simon@harston.de>
# 2015 Jan Vorwerk <jan.vorwerk@angexis.com>
# 2019 Per Magnusson <per.magnusson@gmail.com>
#
# This program is free software: you can redistribute it and/or modify it
# it under the terms of the GNU General Public License as published by
# the Free Software Foundation, either version 3 of the License, or
# ( at your option) any later version.
#
# This program is distributed in the hope that it will be useful,
# but WITHOUT ANY WARRANTY; without even the implied warranty of
# MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
# GNU General Public License for more details.
#
# You should have received a copy of the GNU General Public License
# along with this program. If not, see <http://www.gnu.org/licenses/>.
```