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TeleRein C IT

SD card use

Index.

1.0 General Introduction.

There is provision for using a Micro SD card in TeleRein C IT (TeleRein) for storing rein tension data during a riding session. This has an obvious application; it makes it objectively possible to look over historic data to ascertain if improvements or changes have been made in riding technique.

The following document describes how to set up and use the Micro SD card. It is written with the expectation that the user is familiar with using a PC, plugging devices into USB ports, and working with files. If not, there is another document which gives much greater detail, including screen shots, that should allow the reader to gain familiarity with the processes involved.

Windows operating systems covered are Win 7, 8 and 10. Win XP is not supported since the TeleRein program discussed later will not run under this operating system.

Setting it up on anything but a Widows based system is beyond the scope of this document. However, Mac IOS will read and write files formatted with FAT32, the format required by TeleRein. Mention will be made of Excel later, it also runs under IOS. The TeleRein software described later will not run under IOS.

To gain familiarity with using the SD card, irrespective of whether you are familiar with PC's,
 I would strongly suggest that you set yourself up next to your PC at home and go through the whole process as often as needs be until you are comfortable with it. You don't need a horse to test the process!

Data may be simulated by simultaneously pulling on the rings on either side of the black load cell cases (the large LEDs will flash different colours).
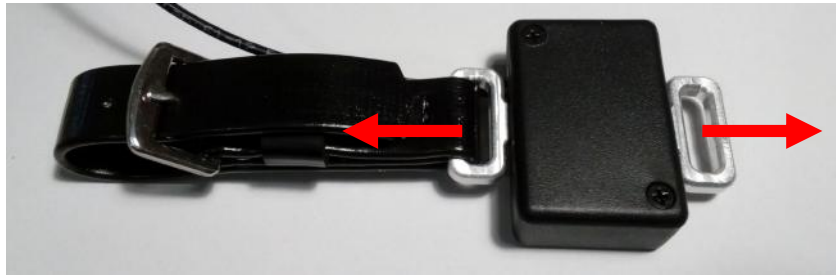
Getting data to change by pulling on the Load Cell rings.

There are many options for processing the data. One discussed here is to use a software application written for the earlier version of TeleRein, which is only capable of displaying the data. More details on using it are given in the second section of this document.

Spreadsheet applications like Excel are more flexible, and offer data processing functions like filtering. If you are unfamiliar with using spreadsheets, I would refer you to the Internet or your library if you need further information.

The data is formatted as comma separated values, or .CSV, which is a standard, and accepted by both applications mentioned.

An appendix covers technical details on the SD card and files, items not appropriate in the body of this text.

20. SD card use.
2.1 Micro SD card specifications.
TeleRein requires an SD card with the properties listed below.

- Micro SD card (11 x 15mm), available from any electronics goods shop.
- Format FAT32. Purchased cards of the recommended size below are normally pre formatted to the FAT specification.
- Capacity 4Gb to 32Gb inclusive. *Cards 64Gbyte and above are formatted differently, and should not be used.*
- Additionally, you will need a USB Micro SD card reader, allowing the card to be plugged into the USB port on a PC.

2.2 Checking the card
However you acquire a micro SD card, you need to check that it is formatted to the specifications required by TeleRein. Plug the card into a PC, Right Click on the USB drive in File Explorer, and Left click on properties. That will display how it is formatted, and its capacity, if it meets the specifications then you may proceed.

3.0 Creating a "seed" file.
Before the Micro SD card may be used in TeleRein, it needs to be plugged into a PC and an initial "seed" file created. The seed file is only used to provide a prefix for file names generated on the TeleRein system. Windows allows long file names, TeleRein can only work with an 8.3 file format.
1. Plug the SD card into a PC. If the SD card has been used before, make sure that all files are saved to your PC before deleting them off the card
2. Open "Note Pad". At this juncture you may type text into the editor with information pertinent to the days session if you wish.
3. Click on "Save As", and create a file name from one to six characters long, any longer than six and TeleRein will truncate it to six. "Notepad" has a default file extension of ".txt", use that. Save the file.
4. "Eject" the card and remove from the PC.

4.0 Using the SD card on TeleRein

The card should be inserted into TeleRein prior to putting the unit on the horse and powering up, preferably at home. It has a push/push mechanism which locks it firmly in place if installed correctly (nearly flush with the case, see image below)

TeleRein initialises the card on power up. For that reason, **don't cycle the power** on the unit off and on during a riding session, or it will overwrite existing file names, and data will be lost.

Don't try and record data until TeleRein has initialised, that is once it has gone through a sequence of displaying a colour spectrum on the two large LEDs.

1. When wishing to record data, momentarily press the small round white Push Button (Power switch), and the small LED should light up. It should be green, although it could be yellow if the red light indicating a low battery is also on.
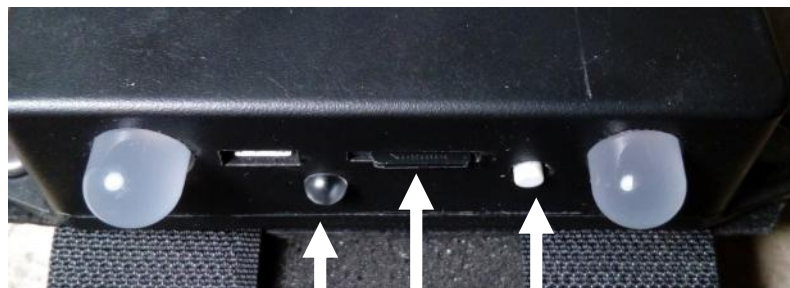
LED SD card Push Button

  A short push of the white Push Button Power ON/OFF switch will not turn the power off.
2. If on pushing the white button, the small LED blinks, then there is an error (one of three) that will not allow data to be recorded. These could be,
    - no SD card inserted, or inserted incorrectly
    - SD initialisation faulty, the card will be faulty in some way
    - more than 99 files recorded

    If the small LED stays on, then rein tension data is being recorded.
3. To stop recording, momentarily press the small round white push button again, and the small green LED will go out.
4. Repeat the process above each time you wish to record data, a new data file is created each time you go through the sequence starting at1. above.

When the riding session is finished, power TeleRein down. Don't remove the card until you are back home, they are small and easily lost.

5.0 Displaying the data.

When you wish to retrieve the data, remove the card from TeleRein. I would suggest doing that at home, the cards are small and easily lost.

1. Plug the card into your PC via a card reader. Copy all of the data files on the SD card into a chosen directory on your PC. If you are using the TeleRein software application it must be C:\TeleRein. If this directory does not exist, then create it. The files created on the SD card look like this:

myfile.txt	("seed" file name)
myfile1.csv	(first data file)
myfile2.csv	
.	
.	
myfile99.csv	(up to 99 files)

    The TeleRein data files have a ".csv" extension, or "comma separated values". This is a common data format.

2. Delete the files on the SD card, ready for your next data recording session. Because of possible file duplication, since such short file names are being used, any files that you wish to keep long term should be renamed at this stage. Perhaps a horses name and something about the riding session could be used (up to 255 characters are possible).

3. You are now ready to display your data. This may be done in a spreadsheet, Excel for example, or using a TeleRein software application.

6.0 TeleRein software Application.

To install TeleRein, download the file and user manual from the TeleRein web site
http://www.TeleRein.co.nz/TeleRein-c-it.html'
NOTE that the FTDI Virtual Com Port driver is not needed, so don't install it, with one caveat. As explained in the Appendix, it is possible to plug the TeleRein unit into a PC via a USB cable to get data and diagnostics from the unit, if you wish to do that, then you must install the drivers.

The TeleRein application installs itself in C:\Perryrange Developments Ltd. You may launch it from there, or create a shortcut and place the application executable some where convenient like the desktop.
When setting up to use the TeleRein application, it expects the data file to be in C:\TeleRein. You will have to create this file and copy your data files into it.

A detailed description of how to use the TeleRein application is given in a manual downloadable from the TeleRein web site.
The only feature available when using the TeleRein software is the ability to read a file that was saved from the application back in to it for display purposes. For that reason, the files created by TeleRein have the same file structure as that created by the TeleRein software application. See the appendix for further details.

Appendix.
SD card, file names and data format

File Names and the "seed" file.
A "seed" file must be written onto the card before use. This allows the user some control over the file name, rather than having a random name generated by TeleRein.
The "seed" file is used as a prefix to generate up to 99 additional data files automatically each time the record button is pushed to start a new recording session.
The "seed" file should be from 1 to 6 characters long, any longer than that and it is truncated by the TeleRein unit. Any three character file extension may be used, ".txt" is a default if using Note Pad. The TeleRein firmware renames the data files to ".csv" regardless.

Seed file example:	Test.txt
TeleRein will generate the first data file:	Test1.csv
And subsequent files:	Test2.csv
	Test3.csv
	.
	.
	.
	Test99.csv

The "seed" file may contain text data.
When the unit is powered down, one additional file is created.

File Description.
The first row has a blank column, followed by "Right" and "Left", associating the appropriate rein with its data. A more normal approach may have been to have the data in a Left to Right sequence. However, the TeleRein application software accepts data in the Right Left format only.
The second and following rows have the time, right hand data, and left hand data, comma separated.

The time is in a hh:mm:ss format, and the rein data is in grams. Below is the initial part of a typical data file.

```
|,Right,Left
00:00:34,0,0
00:00:35,85,0
00:00:36,1000,0
00:00:37,3844,0
00:00:38,3310,8
00:00:39,2209,0
00:00:40,1372,8
00:00:41,1720,0
00:00:42,1666,0
00:00:43,147,0
00:00:44,23,8
```

TeleRein files Date and Time.

The creation of a file on a PC stamps it with the date and time of creation. For that reason, when creating the "seed" file, do it on the day that the card will be used for logging data on TeleRein, that way the date stamp reflects the actual date on which the files were recorded.

TeleRein does not have a Real Time Clock, therefore the time starts at 00:00:00 when the power is turned on, I will call it Local Time.

If you wish to keep track of the actual time that a data file is started, which could be useful if you are keeping track of a particular set of exercises you are working through, then the following is a possible solution.

Use a notebook or voice recorder on a cell phone to note the actual time that TeleRein was turned on. For example, if you record a clock time of 3:10PM for when TeleRein is turned on, and Local Time on your data file starts at 00:45:20, then the data was recorded at Local Time plus the clock time.

3:10PM + 00:45:20 = 15:10:00 + 00:45:20 = 15:55:20 OR 3:55:20PM.

If you are using a spreadsheet to process the data, it will have the capability of doing the maths described above automatically if the appropriate cells and relationships are set up.

TeleRein Diagnostics.

The use of this application requires some familiarity with installing applications on Windows.
TeleRein C IT has a Micro USB port, generally is used for charging the internal battery.
It has two further purposes, firstly, it allows some basic diagnostics to be carried out, and secondly, firmware upgrades are possible via a bootloader.
To get the diagnostic information, you will need to have an FTDI virtual com port driver on your PC.
Go to http://www.ftdichip.com/FTDrivers.htm, you will need to choose the package for your Windows operating system (32 and 64 bit versions available)
Having downloaded it, install it on your PC.
When TeleRein is plugged in via the USB cable, the PC can now enumerate the device and establish a Virtual Com Port connection.
If a terminal program is now run, and the appropriate Com port selected, the data from TeleRein may be observed arriving every second.
I would suggest Bray Terminal, from   https://sites.google.com/site/terminalbpp/
Download the application and install it.
Communications parameters are: 56000,8,none,1, handshake none.
Set data to ASCII in the receive box
Rescan the com port (top left), and click on the appropriate com port from the drop down box.
Click on Connect, and every second the time and right and left data in grams should appear.
Further information may be gained.
Plug a Micro SD card into the unit which has a "seed" file on it as described elsewhere, the unit should be powered when doing this, keeping the serial link alive.
Restart the TeleRein firmware, to do so insert a paper clip into the small hole by the cable on the left hand side of the unit, and gently push and release. The unit will restart and give you additional data

<0>TeleRein C IT	**My Comments**
Firmware version number 1.00	
Unit serial number 3	
Calibration values, L 7.837 R 8.251	**scaling values**
L Tare 32775 R Tare 32489	**ADC out (FS 65535)**
SD Card Type = SDHC Spec. 2.0 or later	**SD card parameters**
12Init File System ... OK --> Btemp1= 0 / Gbdriveerror = 0	
Filesystem = 11	
FAT Start Sector: 12676	
Root Start Sector: 16384	
Data First Sector: 16384	
Max. Cluster Nummber: 236931	
Sectors per Cluster: 64	
Root Entries: 0	
Sectors per FAT: 1854	
Number of FATs: 2	

PLAY.TXT 01\04\18 09:44:40 000:00:01 R 7 L 0	**"seed" file information**
00:00:02 R 7 L 0	**time, R & L rein tension**
00:00:03 R 7 L 8	**in grams**
00:00:04 R 7 L 0	