

# *ETM-Solo Viewer*

**Manual**

**Version 2.0**

Document no.: TH-0321-03

## Table of contents

|                                            |    |
|--------------------------------------------|----|
| Table of contents .....                    | 2  |
| Overview .....                             | 3  |
| Installation .....                         | 4  |
| System requirements for the computer ..... | 4  |
| Installation of the software .....         | 4  |
| CAN interface .....                        | 4  |
| Hardware configuration .....               | 5  |
| License administration .....               | 7  |
| License types .....                        | 7  |
| Activate license .....                     | 7  |
| Check license .....                        | 8  |
| User interface .....                       | 9  |
| Main window .....                          | 9  |
| Detailed user interface description .....  | 9  |
| Settings window .....                      | 10 |
| Detailed settings description .....        | 10 |
| Normal use .....                           | 12 |
| Quick start guide .....                    | 12 |
| Examine graphs .....                       | 13 |
| Mixing sensor types .....                  | 13 |
| Log file .....                             | 14 |
| Logging data to file .....                 | 14 |
| File format .....                          | 14 |
| Troubleshooting .....                      | 15 |

## Overview

**ETM-Solo Viewer** is a PC program used for viewing and logging yarn tension data from ETM-Solo sensors by communicating with the sensors via CAN-buss.

A complete **ETM-Solo Viewer** system consists of:

- 1 to 16 ETM-Solo sensors from Eltex of Sweden AB.
- Termination plug, part no 75015, for the last sensor. Manufactured by Eltex of Sweden AB.
- Modular cables between the sensors. Can be manufactured by Eltex of Sweden AB.
- CAN interface to PC manufactured by IXXAT ([www.ixxat.com](http://www.ixxat.com)). Can be supplied by Eltex of Sweden AB.
- ETM-Solo Viewer PC software for viewing and logging yarn tension data
- Optional CAN cables and power supply set, part no 76620, manufactured by Eltex of Sweden AB after customer specification. Or the customer can make it from the drawing in this document.

The **ETM-Solo Viewer** PC software has the following functions:

- View graphs for up to 16 ETM-Solo sensors at the same time.
- View graphs in groups of four sensors.
- View graph and last digital value for one sensor.
- Settable vertical cursors for min and max tension.
- Tension detection with reaction filter and visual out of range indication.
- Zoom graph and scroll the yarn tension axis.
- Settable sample time.
- Log yarn tension to file.
- Finds number of sensors automatically.

# Installation

## System requirements for the computer

### Hardware

|                  | <i>Minimum</i>                                                       | <i>Recommended</i>             |
|------------------|----------------------------------------------------------------------|--------------------------------|
| <b>Processor</b> | Intel Pentium or compatible.<br>Minimum 500 MHz clock frequency.     | Minimum 1 GHz clock frequency. |
| <b>Memory</b>    | Minimum 256 MB RAM                                                   | Minimum 512 MB RAM             |
| <b>Hard disk</b> | Minimum 500 MB free space.                                           |                                |
| <b>Device</b>    | CD-ROM or DVD device.                                                |                                |
| <b>Screen</b>    | Screen and graphics card with SVGA (800 × 600) or better resolution. |                                |

### Operating system

- Windows 11
- Windows 10
- Windows 8, 8.1
- Windows 7

## Installation of the software

1. Enter the CD-ROM labelled “ETM-Solo Viewer” and wait for the installation menu to display.
2. Select “Install IXXAT CAN driver” and follow the instructions to install IXXAT VCI driver. The latest VCI driver can also be downloaded from [www.ixxat.com](http://www.ixxat.com).
3. Select “Install ETM-Solo Viewer” and follow the instructions.

## CAN interface

The PC program communicates with the ETM-Solo sensors via a CAN bus. It has been designed for CAN interfaces supplied by IXXAT ([www.ixxat.com](http://www.ixxat.com)).

### Hardware driver

ETM-Solo Viewer uses the newer driver interface VCI4. However it may be possible that other applications need older VCI2 to be installed also. This can be done by first uninstalling the old VCI2 driver and then installing VCI4 followed by a special version of VCI2. This install file, Ixxat VCI2onVCI4 Setup, can be found in the install media under folder Redist\Ixxat\VCI\_V4.0.939.0\Add-ons. Detailed information can be found at [www.ixxat.com](http://www.ixxat.com).

### Type of interfaces

Eltex supplies an USB to CAN interface as an accessory (component no. 6883) but the whole range of IXXAT CAN interfaces can be used if they are supported by driver interface VCI4.

## Hardware configuration

### CAN cable and power supply set, part no 76620

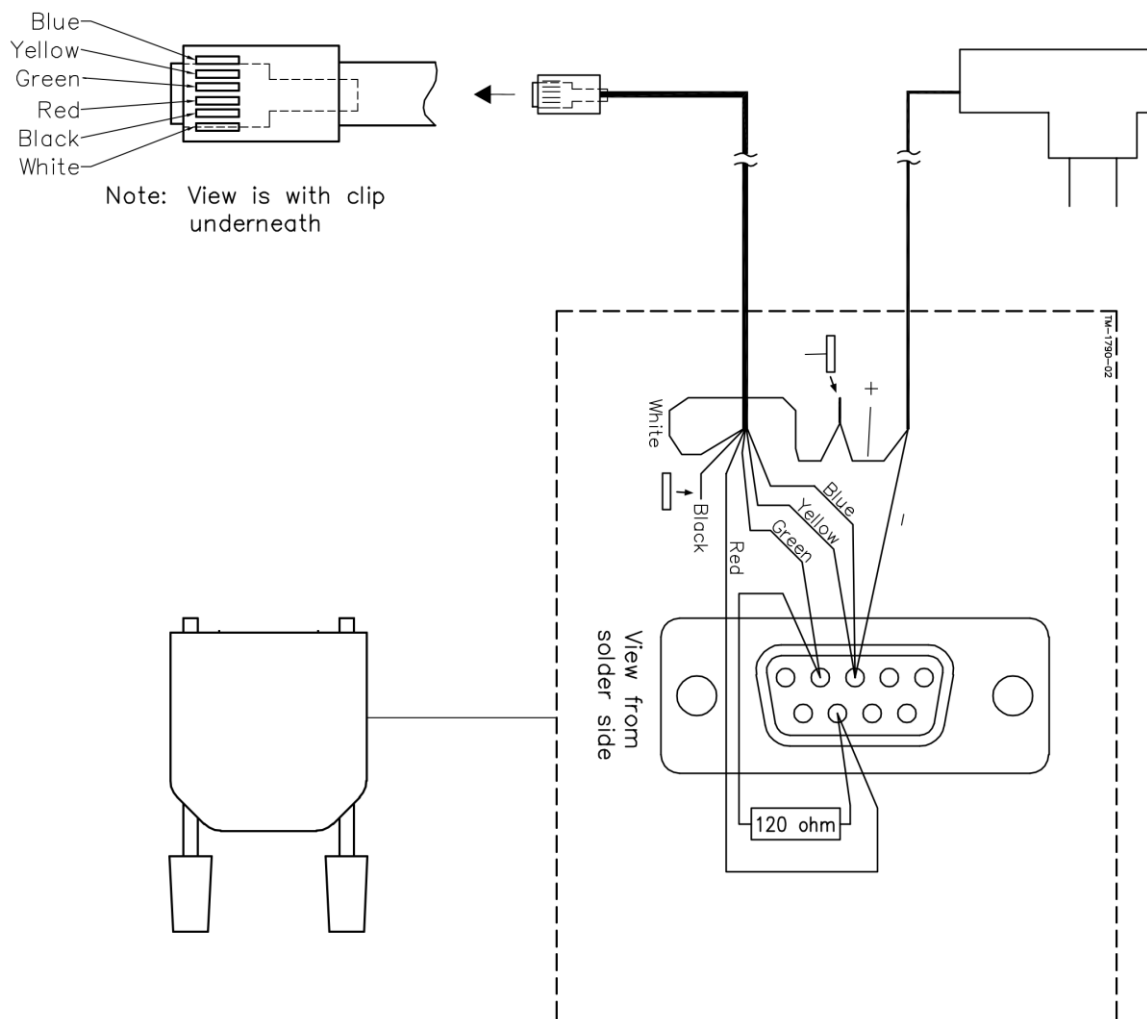


Figure 1: Part no 76620

The CAN cable and power supply set is used for powering the sensors and for connecting the first sensor to the PC via the CAN interface. A maximum of 16 sensors can be sourced. The length of the modular cable to the first sensor is chosen by the customer.

This cable set can also be manufactured by the customer using Figure 1.

In that case please note the following:

- The power supply must be able to source 1.5 A for 16 sensors
- It is recommended to use a 12V DC power supply to keep the power dissipation low but 24V DC is also ok.
- Pin 5 and 6 of the modular plug, the white and black cable in Figure 1, must be connected together.
- Don't forget the 120 Ohm resistor. Without it the CAN communication may not work.
- The connector with the resistor shall be a 9 pin female DSUB to directly fit into an IXXAT CAN interface.

### Sensor cables

The cables between the sensors are straight modular cables with standard 6/6 modular plugs. Straight cables mean that for example the blue cable is connected to pin 1 in both connectors. These cables can also be supplied by Eltex.

### CAN bus termination

For the CAN communication to work reliably the CAN bus needs to be terminated in both ends with a 120 Ohm

resistor.

The end with the CAN interface is taken care of by the cable set described in Figure 1. But in the other end, in the last ETM-Solo sensor, a terminator is also needed.

Eltex terminator plug, part no 75015, is a modular plug with built in terminating resistor. It shall be inserted into the free modular socket in the last sensor.

# License administration

## License types

There are two types of licenses:

- Permanent**                    The license never expires. This is the normal type.
- Time limited**                For demo purposes a time limited license can be issued. The time can be set from one day and up.  
NOTE! The time starts counting when the license key is created and not when the key is first used.

A license can also be set to limit number of sensors that can be viewed simultaneously.

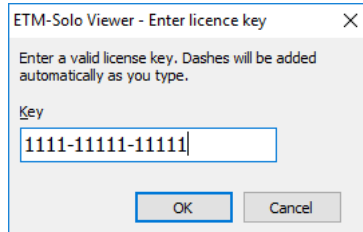
See **Check license** for a description of finding out the information of the current license.

## Activate license

For the program to work, a valid license key must be entered.

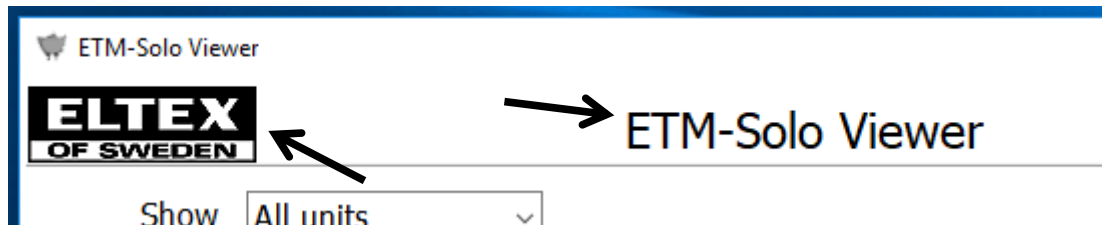
This can be done in two ways:

- Start the application. If the license is invalid, a window will appear requesting you to enter a key.



Enter a key supplied to you either by e-mail or in delivery. Press Ok and the main window will appear. Note! Pressing Cancel also causes the main window to appear but the Start button will not work until a valid license key has been entered.

- In the main window, click on Application title or the Eltex logo.



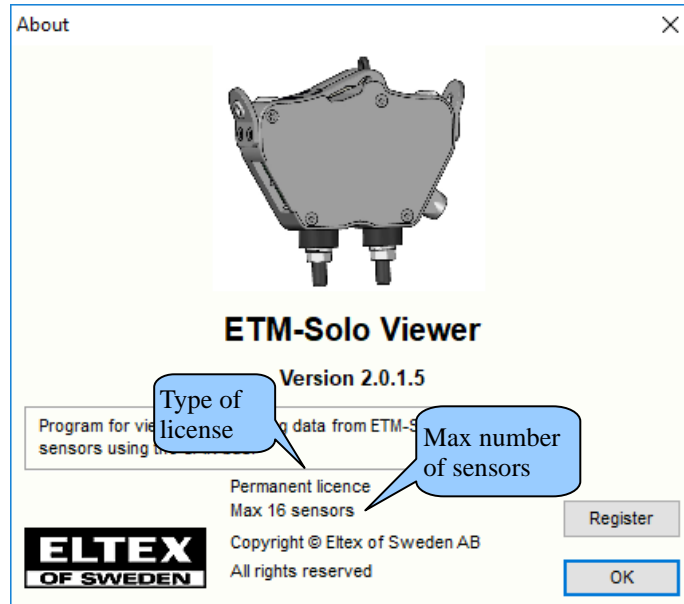
The About window will open. Press Register button and enter key as explained above.

## Check license

A license can either be invalid, time limited or permanent. It also contains number of sensors that can be viewed simultaneously.

### About window

To get license information, open About window as described in **Activate license**.



Type of license and max number of sensors allowed are written in the bottom half of the window.

### Main window

Type of license is also shown to the right of the application title in the main window if the type is time limited or invalid.

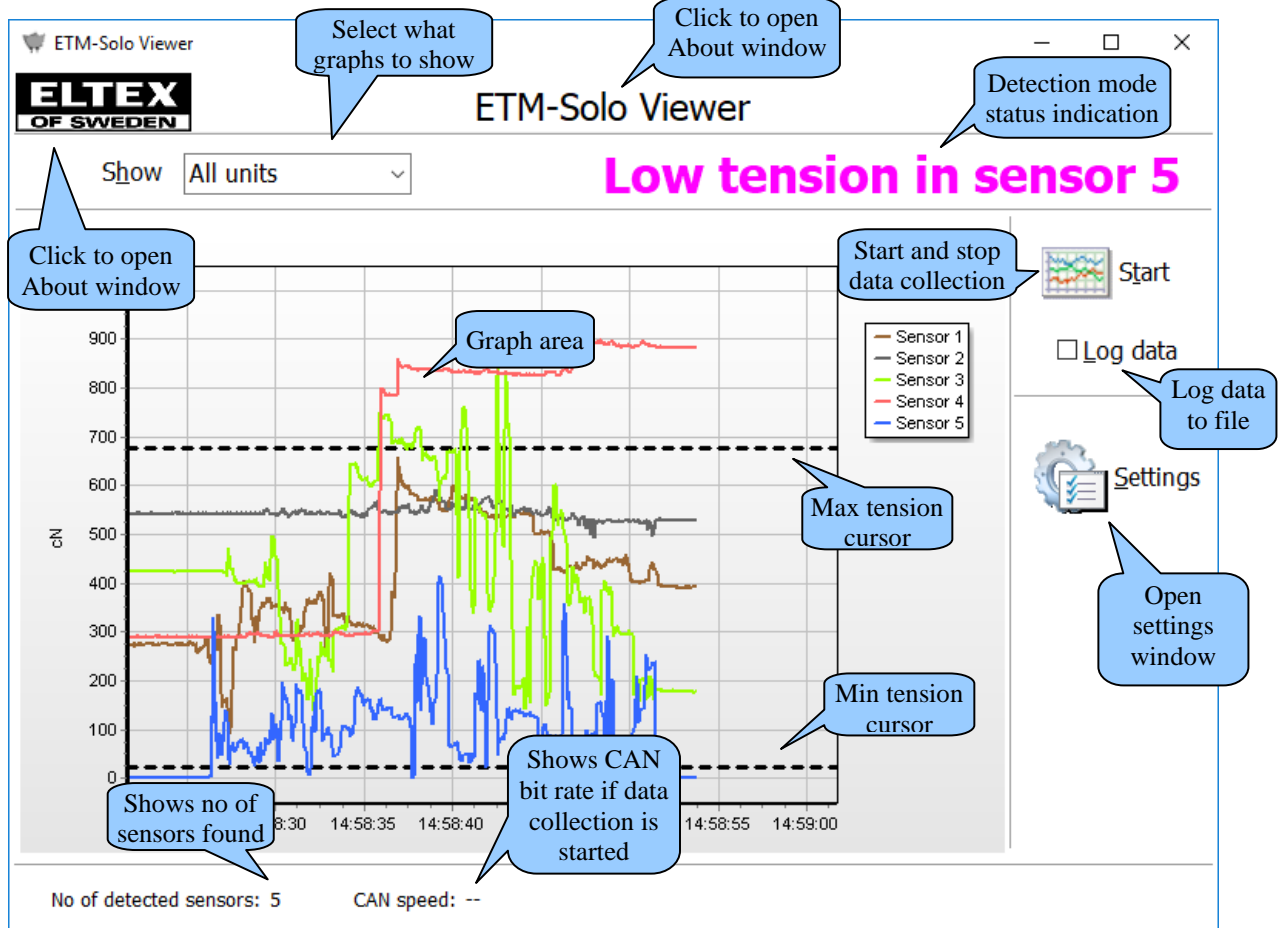




# User interface

## Main window

The layout of the main window is shown below.



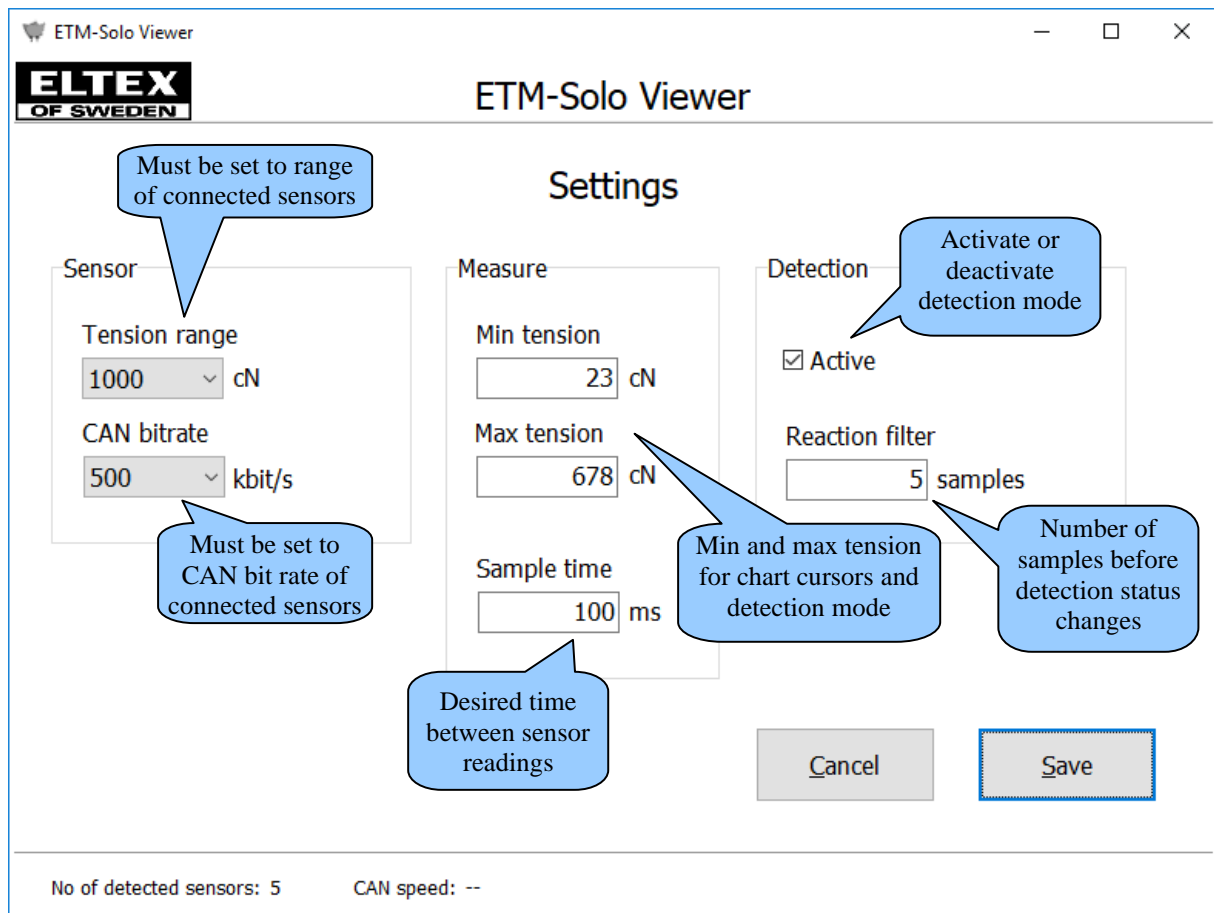
## Detailed user interface description

- Show** Determines what sensors are shown in the graph area. All, a group of four or just one can be selected. If just one is selected, the last read value is also shown as a digital value.
- Graph area** The area where the data from the sensors are drawn.
- Max and min tension cursors** Shows the max and min tension set in the settings window.
- Start (Stop)** Starts the data collection and, if logging is selected, opens a dialog for selecting place and name for a log file. The same button is used to stop the data collection.
- Log data** When checking this, the data collected are written down to a log file. The place and name of the log file is chosen when 'Start' button is pressed.
- Settings** Opens settings window, see below.
- No of detected sensors** Status information showing number of ETM-Solo sensors found. This value is updated as soon as 'Start' button is pressed.

|                                                                              |                                                                                                                                                                                   |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CAN speed</b>                                                             | Shows CAN bitrate used if data collection is started. Otherwise '-' is displayed                                                                                                  |
| <b>Program title 'ETM-Solo Viewer' (top center) or Eltex logo (top left)</b> | Clicking one of these opens the About window with general program information such as version number and license type. The About window is also used when entering a license key. |
| <b>Detection mode status indication</b>                                      | The detection mode status for the last sensor outside selected tension limits. This area is empty if all sensors are within limits.                                               |

## Settings window

The settings window is shown below.



## Detailed settings description

|                      |                                                                                                                                                                            |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tension range</b> | This value must be set to the same range as the ETM-Solo sensors used. The setting only affects the conversion of the sensor value to the value in cN shown in the graphs. |
| <b>CAN bitrate</b>   | This value must be set to the same bitrate as the connected ETM-Solo sensors. Failure to do this will cause communication errors.                                          |
| <b>Min tension</b>   | This setting is used both for displaying a dashed line in the graph area and as the minimum allowed tension value when in detection mode.                                  |
| <b>Max tension</b>   | This setting is used both for displaying a dashed line in the graph area and as the maximum allowed tension value when in detection mode.                                  |

|                        |                                                                                                                                                                                                                                                                                                                                                               |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sample time</b>     | The desired time between sensor data readings. Also affects the time range in the graphs. Even though it is possible to set the value to 1ms, the actual sample time will not be much lower than 40 ms even for a very fast computer. The actual moment for the received data is used in the graphs and log file. This value shall only be seen as a request. |
| <b>Active</b>          | Select if detection mode shall be active. In detection mode the sensor values are compared against the min and max tension and if outside indicated on main window.                                                                                                                                                                                           |
| <b>Reaction filter</b> | Number of samples in a row the tension must cross the min or max level before detection status changes. This makes it possible to settle down the detection status indication in main window                                                                                                                                                                  |

## Normal use

### Quick start guide

This guide assumes that the software and the CAN interface is already installed, see section **Installation**, and that the software has a valid license, see section **License administration**.

### Connect hardware

1. Connect sensors to each other and to the CAN interface.
2. Connect power supply
3. Wait for all the ETM-Solo sensors to have a steady green light

### Start PC program

1. Start ETM-Solo Viewer with the icon on the desktop or from the Windows Start menu.
2. Enter Settings window.
3. Select tension range and CAN bitrate depending on the ETM-Solo sensors used, see Table 1.
4. Select sample time. It is possible to select down to 1 ms but the actual sample time will not be much lower than 40 ms, even for a fast computer. However, since the sample time affects how large the default time range in the graph window will be, it can be useful to set it shorter than 40 ms to get a shorter time range.
5. Set min and max yarn tension allowed. If not used, set min to 0 and max to 3000.
6. If tension detection is desired, click Active checkbox. Also set Reaction filter to calm down status indication.
7. Press Save to exit settings window.
8. Tick **Log data** checkbox if data shall be logged to file.
9. Press 'Start' button to start collecting data. The button will change name to 'Stop'.
10. Press 'Stop' button to stop collecting data.

| <i>ETM-Solo part no</i> | <i>CAN bitrate (kbit/s)</i> | <i>Tension range (cN)</i> |
|-------------------------|-----------------------------|---------------------------|
| <b>56000</b>            | 500                         | 1000                      |
| <b>56001</b>            | 1000                        | 1000                      |
| <b>56003</b>            | 1000                        | 1000                      |
| <b>56004</b>            | 500                         | 1000                      |
| <b>56005</b>            | 1000                        | 1000                      |
| <b>56006</b>            | 1000                        | 1000                      |
| <b>56007</b>            | 1000                        | 1000                      |
| <b>56008</b>            | 500                         | 1000                      |
| <b>56060</b>            | 500                         | 1000                      |
| <b>56071</b>            | 500                         | 2500                      |
| <b>56072</b>            | 1000                        | 2500                      |
| <b>56073</b>            | 500                         | 1000                      |
| <b>56074</b>            | 500                         | 2500                      |
| <b>56075</b>            | 1000                        | 2500                      |
| <b>56076</b>            | 1000                        | 2500                      |
| <b>56077</b>            | 1000                        | 2500                      |
| <b>56078</b>            | 500                         | 2500                      |
| <b>56079</b>            | 1000                        | 2500                      |

Table 1: Settings for ETM-Solo sensors

## *Examine graphs*

Graphs can be moved up and down (panned) and zoomed. This can be done both with data collection started and stopped. All graphs are affected even when only one is shown.

### **Panning**

Click and hold the right mouse button with the mouse cursor within the graph area. Move the mouse up and down. The graphs and the values on the vertical axis will move accordingly

### **Zoom**

Zooming is done by clicking and holding the left mouse button in the graph area while moving the mouse to the right and down (or up). A rectangle will be drawn showing exactly the area that will be zoomed in.

The zoomed area can in turn be zoomed in even more by repeating the same technique. Consecutive zooming can be done any number of times.

When data collection is started, every time the graphs reach the end the horizontal axis is scrolled and the graphs continue from the middle of the graph area. This makes it impossible to zoom data in the past unless the data collection is stopped first.

### **Undo panning and zoom**

To undo all panning and zoom operations, click and hold the left mouse button in the graph area while moving the mouse to the left and down (or up) drawing a rectangle. It is the same technique as for zooming but the rectangle is drawn from right to left instead of from left to right.

It is not possible to undo only the latest panning or zoom.

## *Mixing sensor types*

There are a few different combinations of ETM-Solo sensors, see Table 1, and not all can be used together.

### **CAN bitrate**

When mixing sensor types they must have the same CAN bitrate. The CAN protocol doesn't allow different bitrates in the same bus.

### **Measuring range**

Mixing sensors with different measuring range is possible. The down side is that the tension values in the graphs will not be correct for some sensors. The reason is that the max value from all type of sensors is the same regardless of the tension range. This means that the value from a 1000 cN and a 2500 cN sensor is the same at max range. To be able to draw the graphs in cN, the program needs to be told the max tension range of the sensors with the 'Tension range' setting. However, this setting affects all graphs causing some sensors to show too low or too high tension values in case all do not have the same tension range.

The data written down to the log file is not affected by the 'Tension range' setting since the sensor's raw values are used. See section **Log file** for more information.

# Log file

## Logging data to file

With checkbox 'Log data' ticked, when starting data collection the user is presented with a dialog requesting to select a place and filename for the log file. The default filename is 'Log' with current date and time appended and extension 'csv'.

## File format

The logged data are stored as comma separated values, a CSV- file. The file is in ASCII format (text) and the actual separator between the values is semicolon (;).

Most spreadsheet programs can import this file either directly or via a simple import function.

## Structure

An example of a log file can be seen below:

```
Time;Sensor 1;Sensor 2;Sensor 3;Sensor 4;Sensor 5
40896,3723070139;2714;7088;6698;11092;7182
40896,3723084375;996;6958;8217;11480;852
40896,3723098727;3298;7219;5524;15494;229
40896,3723113194;6941;7938;4246;19825;393
40896,3723127662;10618;9833;4626;21234;229
40896,3723142361;14638;12707;828;19156;1246
40896,3723156597;15085;1862;4384;16374;1639
```

The first row in the file contains headers for the different columns. The columns are separated with a semicolon. The file always has a time column. The sensor columns depend on number of sensors connected. In this example there are five sensors connected.

The second row and till the end of the file are the actual data, one row for each sample time.

## Sample time

The first column is the sample time. It is in standard Windows time format which means that after importing to a spreadsheet, change the cells format in that column to time.

## Sensor values

From column two are the values read from the sensors. The value ranges between 0 which is 0 cN and 65535 which is maximum range for the specific sensor (see Table 1).

A formula for calculating the actual yarn tension looks like this:

$$Yarntension = \frac{Sensorvalue * Measuringrange}{65635} cN$$

Sensor value is the value from the log file.

Measuring range depends on sensor, see Table 1.

This formula can easily be entered into a spreadsheet.

Since the measuring range in the formula can be set differently for each column, sensors with different tension range can be logged at the same time.

# Troubleshooting

Some of the most common problems are listed here

| <i>Error message</i>                         | <i>Solution</i>                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No sensor found                              | Check that CAN bitrate is set correctly, see Table 1.<br>Check that terminator plug, 75015, is mounted in the last sensor.<br>If sensor indication is off, check power supply (10-26V).<br>If sensor indication is flashing red/green, check that pin 5 and 6 of the modular plug (the white and black cable in Figure 1) are connected together. |
| No valid license                             | Check in 'About' window the status of the license, see section <b>License administration</b> .                                                                                                                                                                                                                                                    |
| CAN answer missing or CAN in sensor disabled | Check cables between sensors and between first sensor and PC.                                                                                                                                                                                                                                                                                     |
| CAN device initialization failed             | Check that IXXAT CAN driver VCI4 is installed.                                                                                                                                                                                                                                                                                                    |
| CAN controller initialization failed         | Check that IXXAT CAN interface is not already in use by another application (another ETM-Solo Viewer perhaps?).                                                                                                                                                                                                                                   |



**ELTEX OF SWEDEN AB • Södra Portgatan 19 • SE-283 50 OSBY • TEL +46 479 536300  
EPOST: [info@eltex.se](mailto:info@eltex.se) • WEB: [www.eltex.se](http://www.eltex.se)**

2023-05-15/TH-0321-03 Manual ETM-Solo Viewer EN.pdf