VANDEWIELE

iro®



Ref. no. 34-8930-2001-08/2642 [xx34]

Operating Instructions

EN |

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Original language English

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Important information

This section contains important safety information. Read the manual carefully before installing, using or maintaining the weft feeder.

WARNING

Indicates a possible dangerous situation which could Indicates a possible dangerous situation which could result in serious injury or damage to the unit.

CAUTION

Indicates a possible dangerous situation which could result in serious injury or damage to the unit.

NOTE

Used in order to draw attention to important information, which facilitates operation or handling.

Vandewiele Sweden AB reserve the right to change the contents of the user's guide and technical specifications without prior notification.

Warnings

- **The power supply must be switched off at the mains switch before any work is carried out on the feeder or any other electrical components. The feeder, cabinet and connectors must be fully assembled and closed before the power supply is connected.**
- **The DC link capacitors RB+ and RB- and the test contacts DC+ and DC- on the supply, motors and option modules can carry life-threatening voltages of up to 875VDC. After disconnecting the servo drive from the mains supply, wait until the voltage has fallen below 50VDC. Only then it is safe to work. Measure the voltage on the test contacts properly. Secure that the work area properly.**
- **All work on electrical components must be carried out by a qualified electrician.**
- **This product is not intended for use in potentially explosive atmospheres or in zones classified according to the European directive 14/34/EC. Please contact Vandewiele Sweden AB if products for use in a potentially explosive atmosphere are required.**
- **Routine checks for damaged or worn parts must be made before operating this equipment. Any part that is worn or damaged should be properly repaired or replaced by authorized personnel. To avoid risk of injury DO NOT operate this equipment if any component does not appear to be functioning correctly.**
- **If cabinet needs to be opened, the Zero Twist shall be cleaned from dust and then moved to another room, which hasn't been subjected to carbon fiber dust. Before opening, clean the Zero Twist with a wet cloth**
- **Take necessary precautions to avoid injuries when interacting with the product. Use suitable respiratory and eye protection.**
- **Improper handling at repair, fault finding or similar may damage the feeder/interface mechanical/electrical components including.cables and connectors. DO NOT perform measurements on feeder electrical components and parts. Please contact your local IRO service station for further information.**
- **Carbon fibers are electrically conductive which can cause short circuits in the electrical cabinet.**

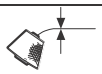
CAUTION!

- **Caution must be taken in the close vicinity of the feeder as it contains moving parts that can cause injuries and, in normal operation, starts without prior warning.**
- **To comply with C.E. Regulations only replacement parts approved by Vandewiele Sweden AB may be used.**
- **The feeder is an industrial product and therefore not approved to use household environments /in residential areas.**
- **Caution must be taken when closing the hatches so that the operator does not get jammed.**

Note

- **Please dispose of obsolete or unwanted equipment responsibly, taking into consideration any local regulations regarding the disposal and / or recycling of materials that are applicable.**

Technical Specification

	Max 850 m/min. Depends on yarn, bobbin and application.
	230 Kg
	Min +5°C –Max +40°C
	max 85% Rh
	Sound pressure Lpa <70 dB (A) Sound power Lwa 81,4 dB (A)
	Tape yarn, Max 10 mm wide. Max bobbin weight 7kg Bobbin fixation may need special part depending on bobbin center. If required, contact Vandewiele Sweden AB.
	Rated voltage: 3 PH+N 400 / 480 V AC Frequency: 50/60 Hz Max:19kVA
 Fuse	3x16 A Supply cable Min: 5x2.5 mm²
Fuse recommendation from Beckhoff	Servo drivers with a built-in mains filter may exhibit a small leakage current due to the capacitors in the filter. This fault current may Cause malfunctions of standard residual current circuit breakers. Therefore, use so-called AC/DC-sensitive residual current circuit breakers type B, in which DC current is also accounted for. Beckhoff recommends residual current circuit breakers with switch-on delay.

NOTE WARNING!



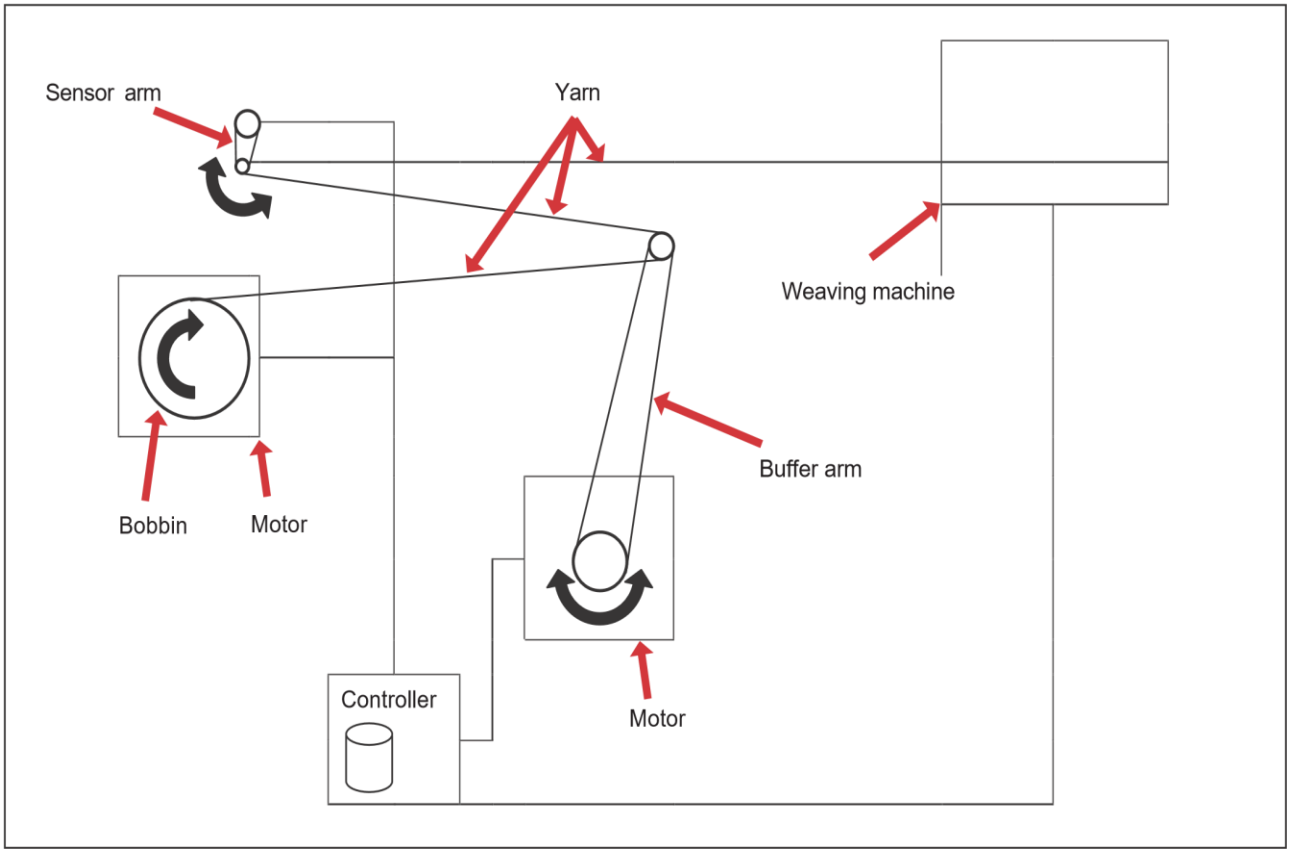
Subject to technical modifications. **Hearing protection must be worn when operating this equipment.**

System Overview

A motor driven bobbin is rotated to give the average amount of yarn consumed by the weaving machine and a motor driven buffer arm takes care of the difference between the constantly rotating bobbin and the rapier machine insertion. The bobbin rotation and the buffer arm are synchronized with the weaving machine. A sensor arm is used to measure deviations in the process and make corrections in the control system.

As the yarn is rolled off tangentially from the bobbin, a tape yarn that is rolled on without twist will be rolled off without twist.

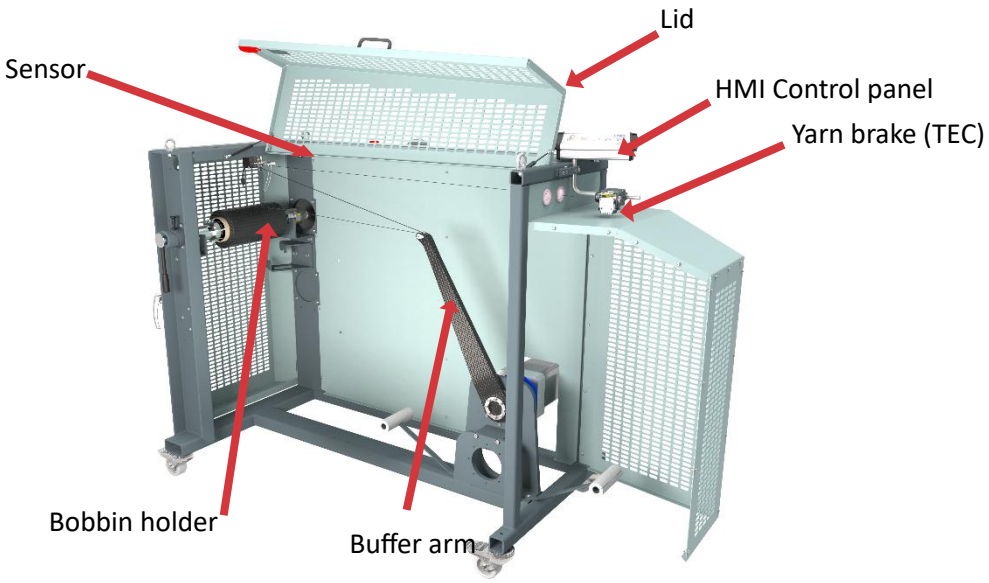
To make the synchronization with the weaving machine it is necessary to make a learning procedure before starting a new article or exchange to a new bobbin type.

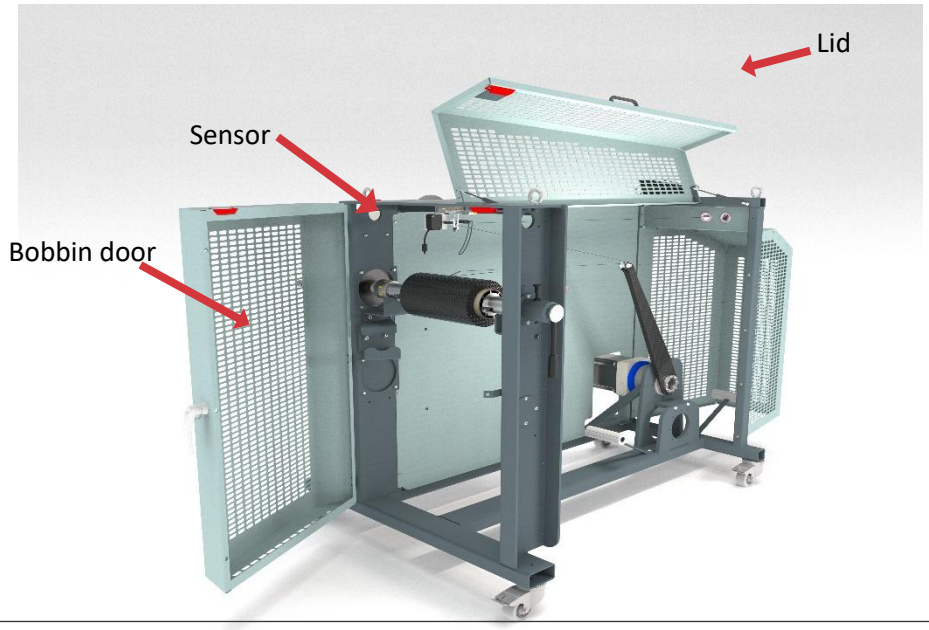


NOTE

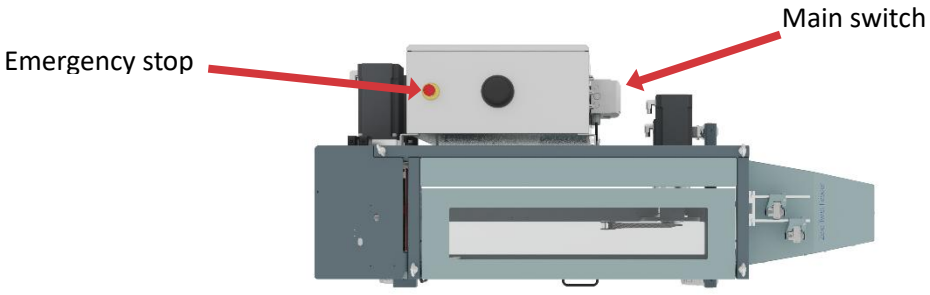
This document describes a stand-alone system to be installed on an existing machine.

Main Parts





Top

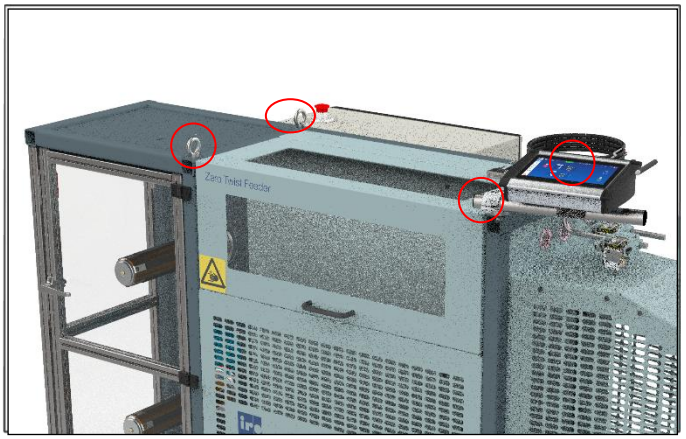


Installation

Condensation can form on the feeder when it is moved from the cold environment of the warehouse to the warmer environment of the loom room. Make sure that the feeder is dry before switching it on.

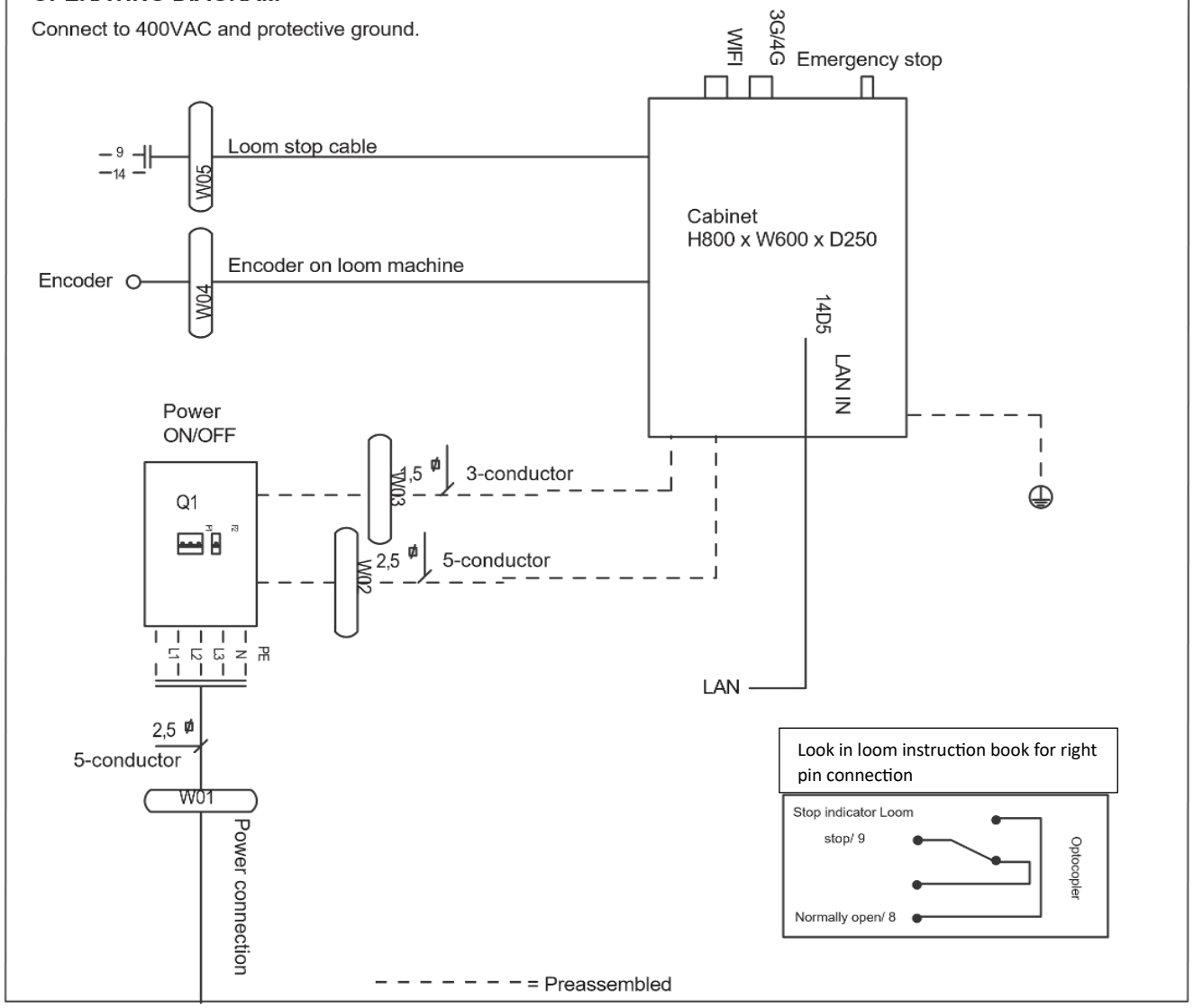
TRANSPORTATION

Use the lifting eyes, shown below to lift and transport the Zero Twist Feeder.



OPERATING DIAGRAM

Connect to 400VAC and protective ground.



Encoder Installation

An encoder provided by Vandewiele Sweden AB or specified by Vandewiele Sweden AB shall be installed at the weaving machine main shaft.

It is of outmost importance that the encoder shaft is installed in accordance with the product manual to ensure the life length of the encoder. It is the responsibility of the customer to install the encoder in the right way.

Specification of cable and connector – see separate document.

WARNING!
Setting needed: The encoder is of absolute type. After installation and connection, the ZTF and loom main shaft angles must be synchronized. This is done by Vandewiele Sweden AB in the ZTF feeder software.

CONNECTION TO THE WEAVING

MACHINE STOP LINE

The stop line from the Zero Twist feeder shall be connected to the weaving machine stop input. Use the cable provided on the ZTF.

SECURITY CAGE

The ZTW has a security cage with switches on the lids. If a lid is opened the motors are stopped as fast as possible and then the power to the motors is switched off (STO, Safe Torque Off).

WARNING!
Do not insert any object or body limb into the cage while the ZTF is running or at stop before everything is stationary.





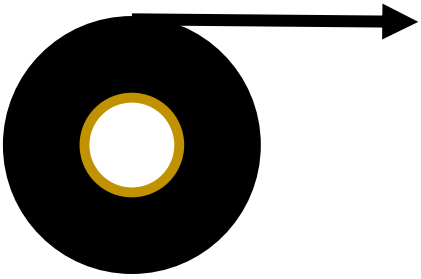
Example of encoder installed on a weaving machine.

Install Bobbin

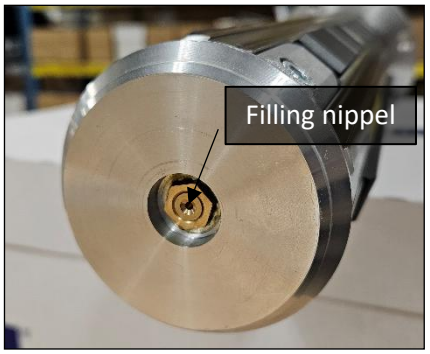
Use bobbin tubes that are 3" (3 inch/Ø76mm) inside.
Install the bobbin with the yarn unwinding on top. (see picture 1)
Lock the bobbin with compressed air. 3 to 6 bars. (max 8 bars)
Filling nipple on the end of the bobbin holder.

To change the bobbin, simply release the air through the filling nipple. Press with a finger or plastic pin.

Picture: 1

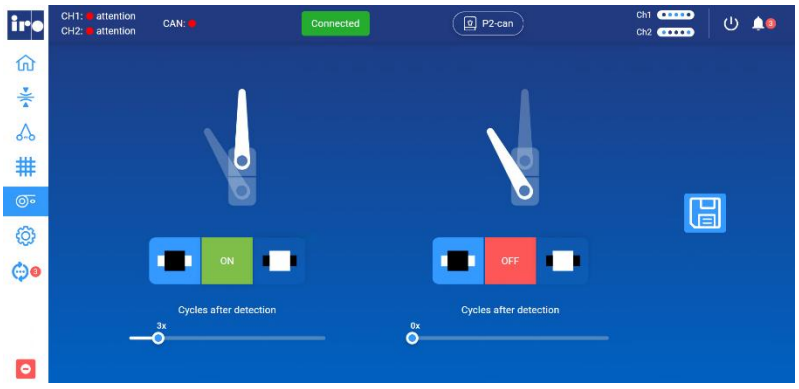


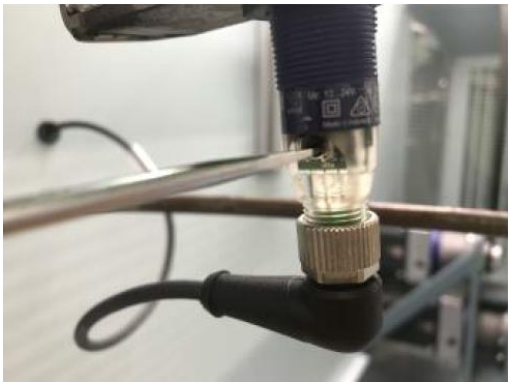
Picture: 2



Setup End of Bobbin sensor (EoB)

In the HMI menu (page 5)
Set ON / OFF and check if it should check for light or dark bobbin tube.
Sensor is looking for different between dark and light.
Use a bobbin with some yarn left. Which is OK to leave.
Adjust the sensor with a screwdriver so that it indicates (lamp lights up). Turn the bobbin back and forth a little to see if the light comes on and off. Then you are in the right position.
It is also possible to fine tune how many insert the loom will do after EoB is activated. (Cycles after detection)





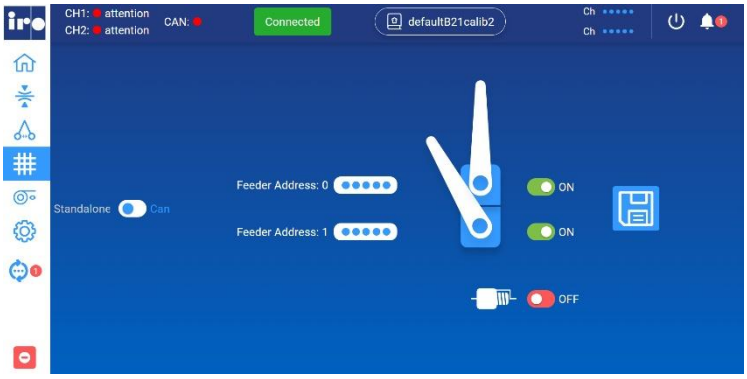
Setup Color selectors (Pattern)

In the HMI menu (page 19)

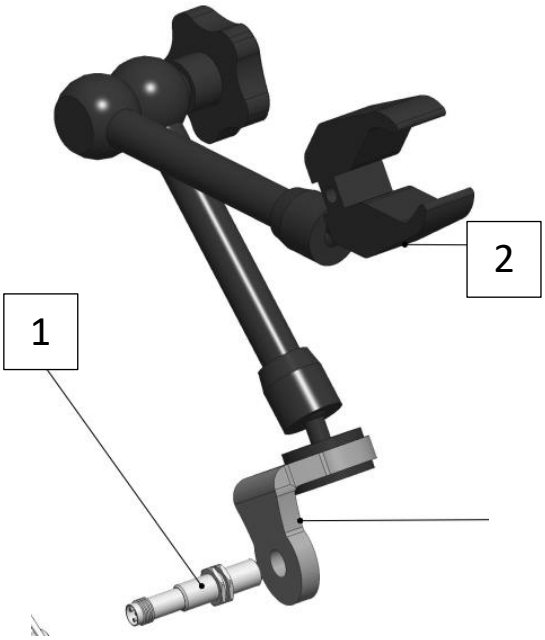
If you have a Mix machine with NO CAN, you must set up the color selectors to be able to run mix pattern.
IRO deliver color selectors device to assembly on the loom machine.

Sensor (1) is a sensor that detects metal.
Assembly sensor (1) can detect metal on color selector pin on the loom.
Be careful not to hit the shaft or other moving parts on the loom machine.

The arm (2) is flexible for best possible assembly position. Tight hard when the right position has been found.



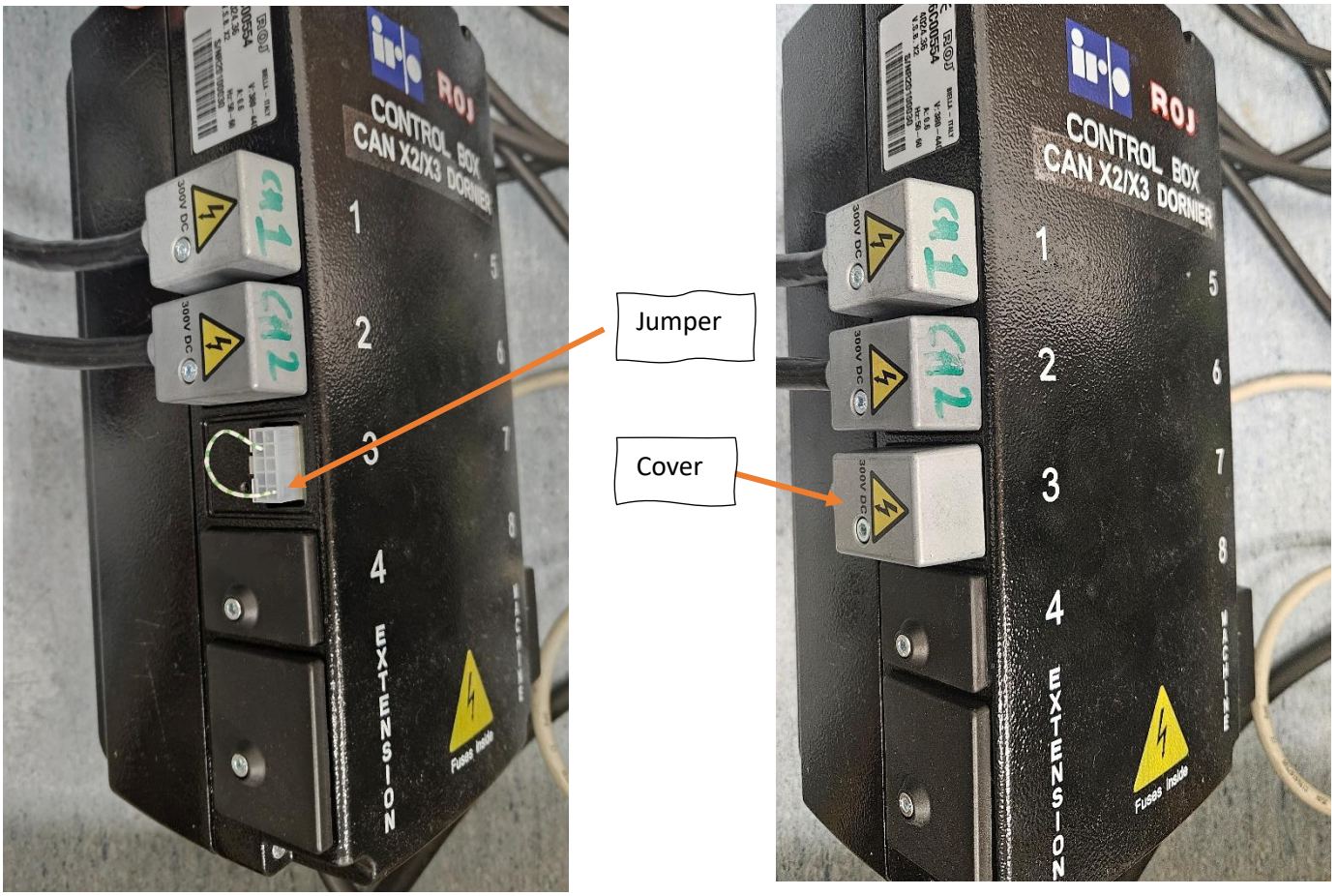




CAN Setup

If you have a loom machine whit CAN communication and want to use CAN communication for pattern to the Zero Twist, you must use a Control Box for CAN (art.no: 56C00561) and a Jumper (art.no:34-0524) or an IRO Feeder (Luna or Chrono)

The jumper can be put on any slot after the cables to Zero Twist CAN box.
Cover the jumper to protect the box from dust



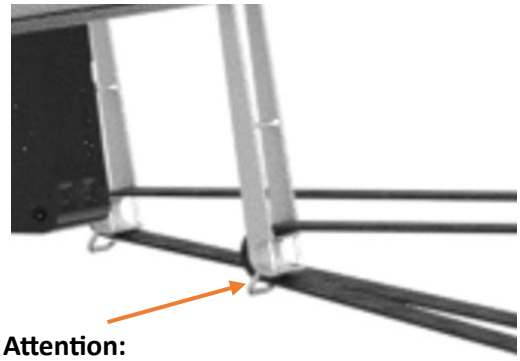
Connection box for CAN cables is located on the side of the electrical cabinet. Markt Ch1 and Ch1



Thread up

WARNING!
Make sure that the output of the yarn is on the upper side of the bobbin.





Attention:
Look that the yarn is threading through the arch on the underside of the sensor arm

Open the lid to reach the buffer arm.
The buffer arm should be positioned upwards.

Thread up the yarn from the bobbin through the buffer arm and through the yarn sensor arm.
Ensure that the tape/yarn is not twisted.

When the hatch is open the motors are turned off.
The arm and bobbin can in this mode be freely moved by hand.
Ensure that the tape/yarn is stretched to avoid entangling when the lid is closed.
and the machine goes over to Thread mode.
If not, press the Thread-up button. (blue)

In Thread Up mode, ZTF will allow pulling of the yarn tip and keep tension of the yarn to avoid the thread to be tangled up inside the ZTF.

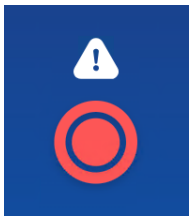
Pull the yarn tip and connect it to the weaving machine in the position where the rapier can take the yarn in the right way.

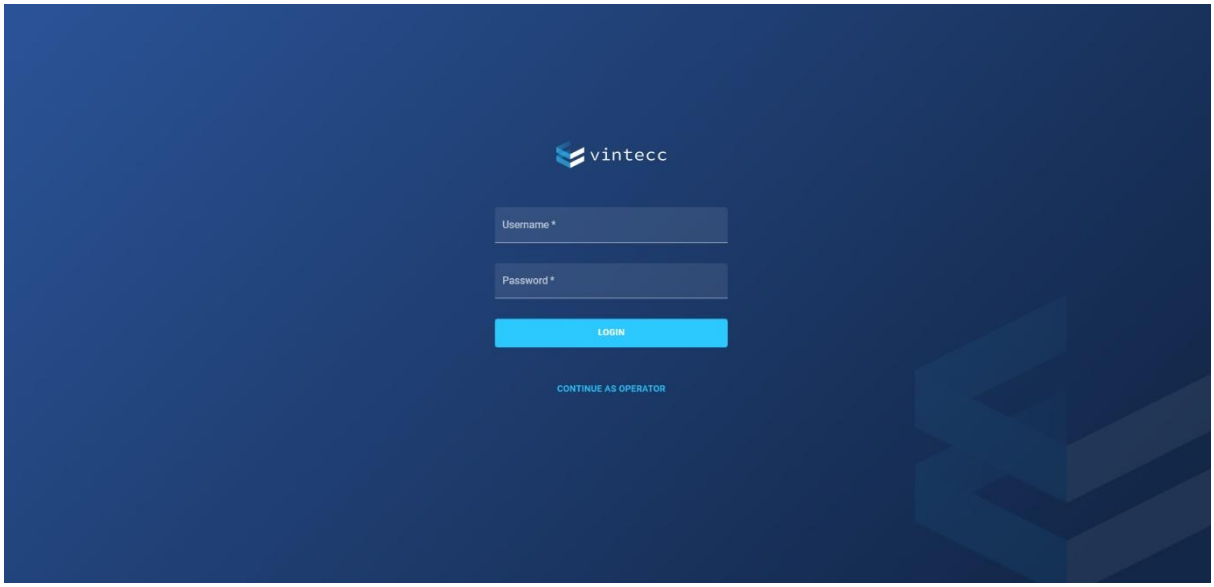
After the thread up has been done the user has the following options:

- Zero Twist Calibration (page 21)
- Put Zero Twist in “Ready to Weave”-mode (Page 22)

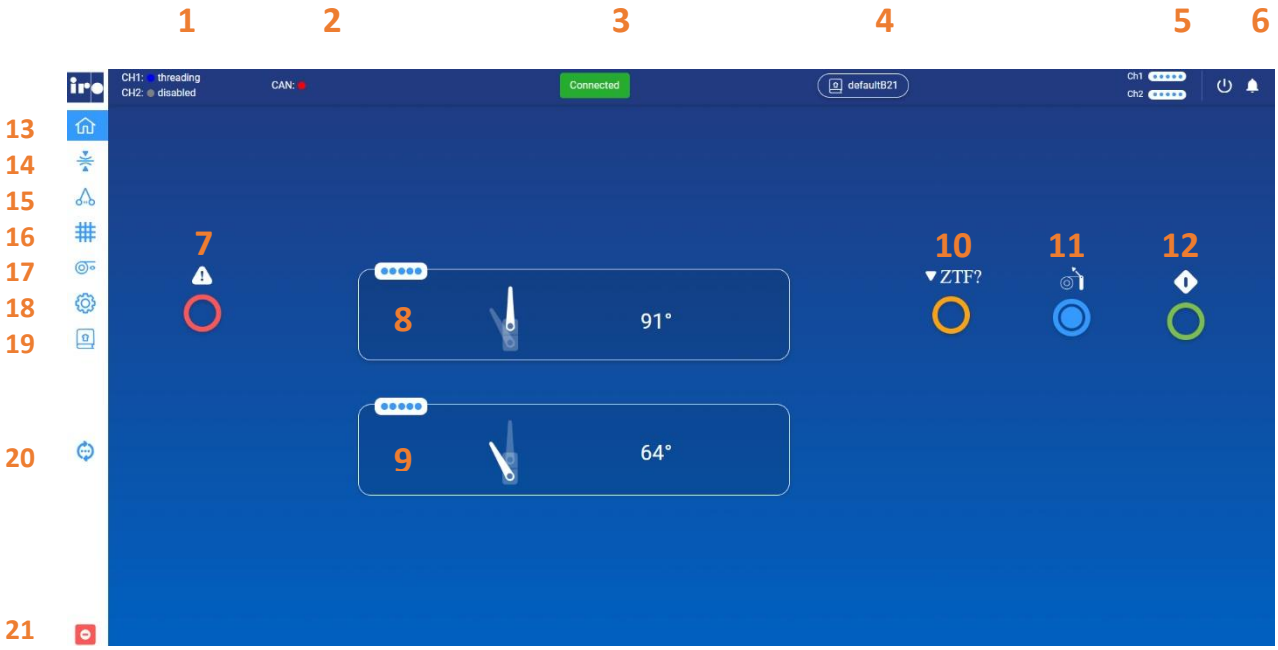
Control panel



Button	Button name	Function
	Attention (Red)	Lamp flash when there is a problem with the ZTF. The lamp gives a solid red light when it is ready for restart.
	Calibration (Orange)	Calibrate Zero Twist how much yarn the loom machine takes and if it's one or to gripper
	Thread Up (Blue)	The ZTF is in thread mode which means that the motor for the buffer arm is on and kept still and the motor that rotates the bobbin is on and will supply yarn when the operator is pulling the yarn through the sensor arm. The ZTF automatically goes to this state when the weaving machine stops. The blue lamp light is always solid.
	Ready to weave. (Green)	Arms the ZTF before weaving. Push this button ***before*** starting the weaving machine. When the light flashes the ZTF is preparing to enter the ready mode. When the light is solid (green) the ZTF is ready.


vintecc
Username *
Password *
LOGIN
CONTINUE AS OPERATOR

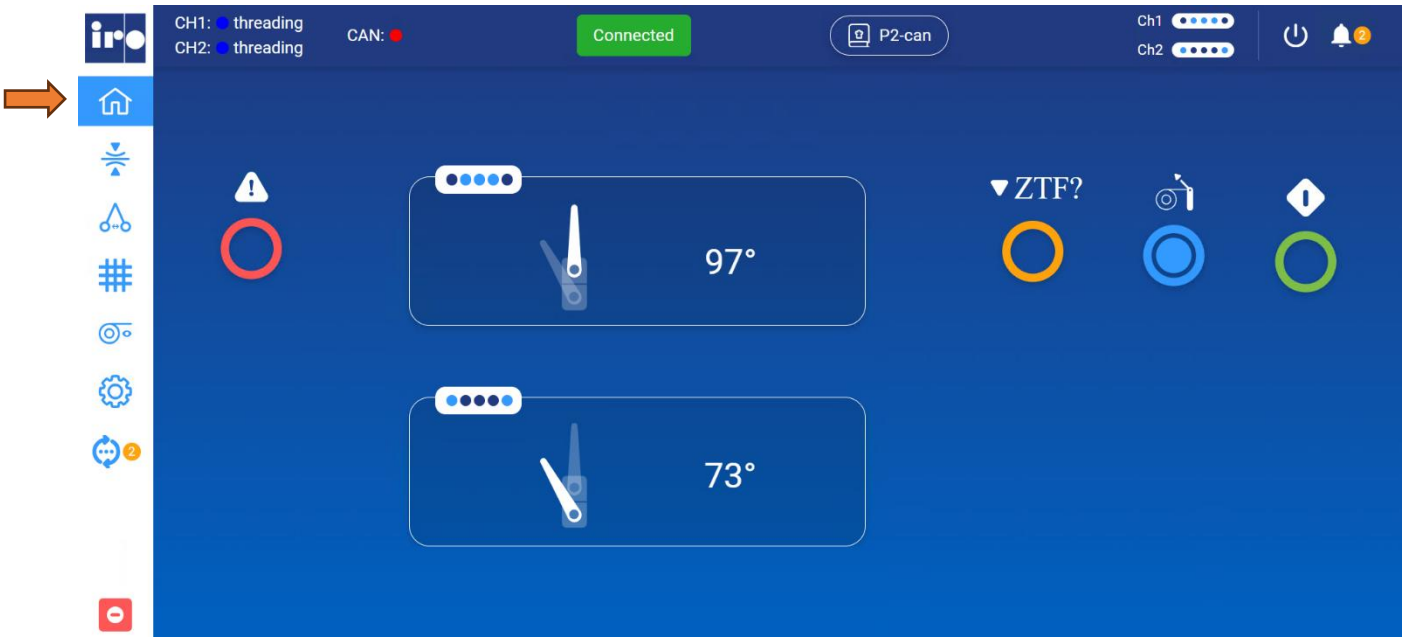
Start Page:



Start page:

1. Zero Twist State. (Attention, Thread Up or Run mode).
2. If CAN is connected and active.
3. Connected to Zero Twist HMI server.
4. Loaded recipe.
5. Pattern in advance. (To see the pattern)
6. Alarm list.
7. Zero Twist state (attention).
8. Ch1 upper buffer arm with arm angle and pattern info from loom.
9. Ch2 lower buffer arm with arm angle and pattern info from loom. (only on mix machine)
10. Zero Twist Calibration.
11. Thread Up state (Blue).
12. Run state (Green).
13. Start page.
14. Brake settings.
15. Sensor arm graph.
16. Pattern settings.
17. End of Bobbin.
18. Loom encoder settings.
19. Weaving Technical page.
20. Alarm list.
21. Logg out.

Start page: Thread Up

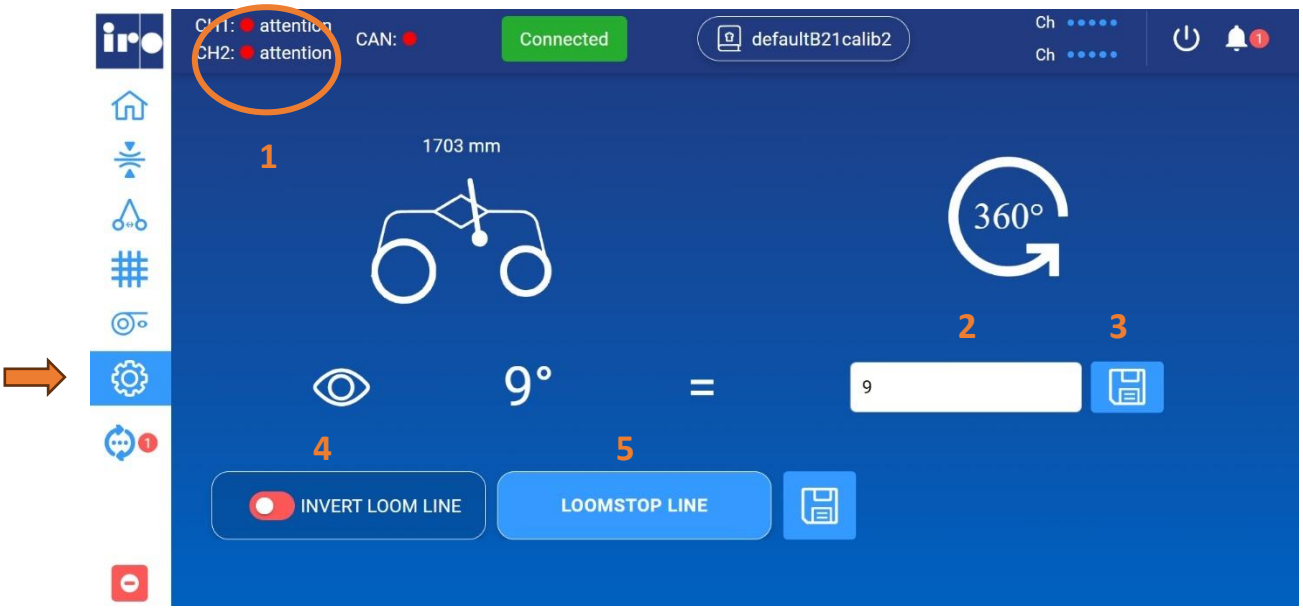


Thread Up: (Blue)

1. Basic position where Zero Twist is active.
   If you need to pull out yarn by hand or take out the knot when changing bobbins.
2. If the loom needs to be adjusted, reversed, etc.

1. Set loom angle on HMI. (Synchronize with loom: Side 18)
2. Activate/Deactivate End of Bobbin. (End of Bobbin: side 19)
3. Choose the right patten Single/Mix/CAN. (Pattern settings: side 20)
4. Set up brake value. (Brake settings: side 21)
5. Calibration. (Start page: Zero Twist Calibration: side 22)
6. Put Zero Twist in Run mode (Start page: Run: side 23)

Synchronize with Loom:

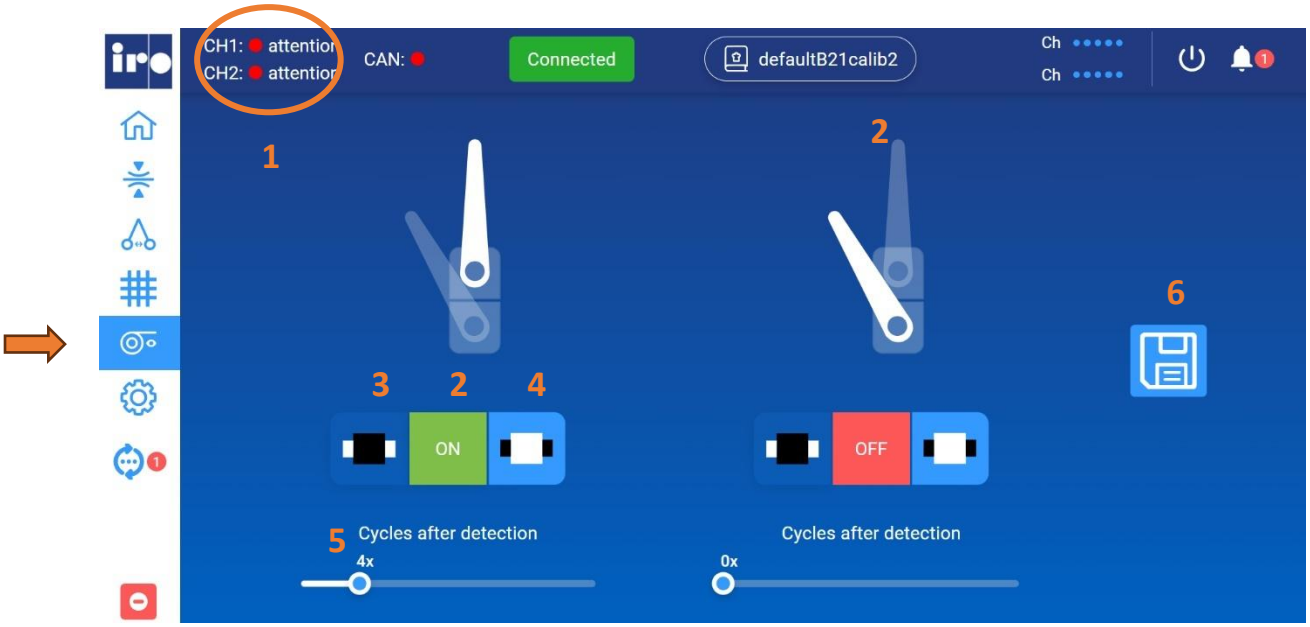


Synchronize Zero Twist encoder:

1. Zero Twist MUST be in attention mode (Red) to save.
   (security so no changes can be made during operation/run)
2. Look at loom display and type in the same value.
3. Save.
4. Default is Zero Twist loom stop line open and close then stop line is active.
   It´s possible to invert.
5. Test of loom stop line.

   Press save if save icon (2) is orange.

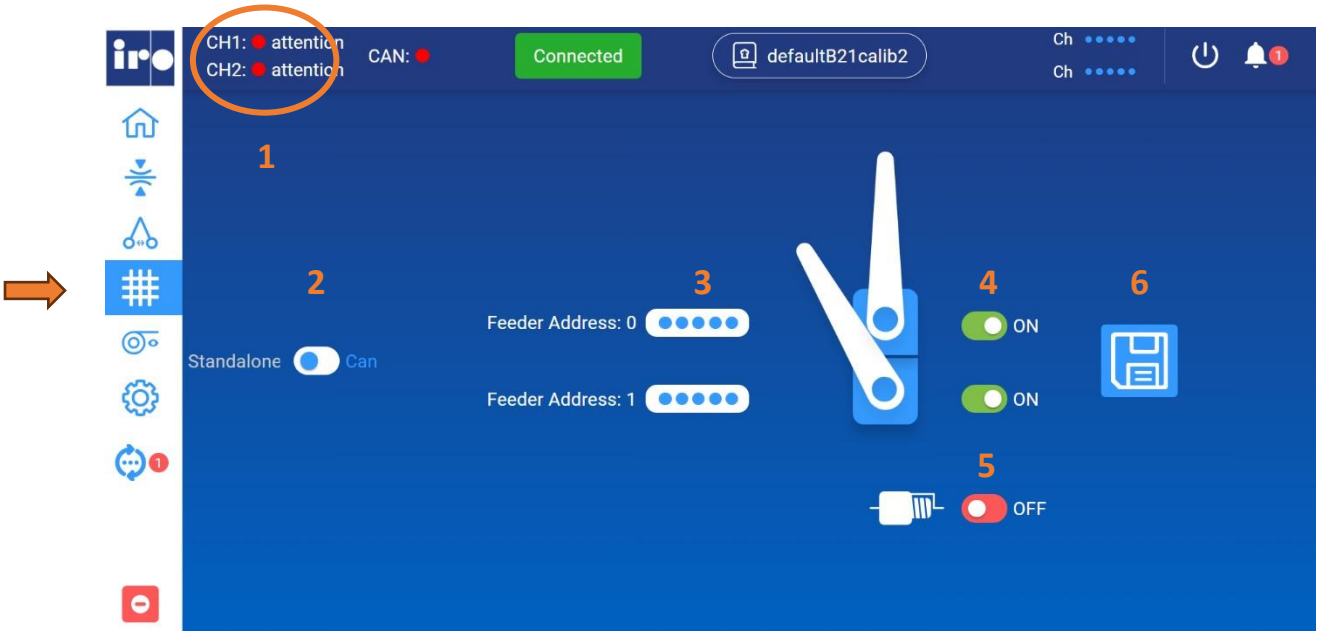
End of Bobbin:



End of Bobbin: (EoB)

1. Zero Twist MUST be in attention mode (Red) to save.
   (security so no changes can be made during operation/run)
2. Choose ON/OFF for channel Ch1 (upper) and/or Ch2 (lower.)
3. Choose this if yarn is darker than the bobbin tube.
4. Choose this if yarn is brighter than the bobbin tube.
5. Number of inserts after detection.
6. Press Save if save icon (6) is orange.

Pattern settings:



Pattern settings:

1. Zero Twist MUST be in attention mode (Red) to save.
   (security so no changes can be made during operation/run)
2. CAN: On/Off (if using CAN, that must be set and saved BEFORE starting the loom)
3. To see the five next insertions in advance
4. Set which channel you are using. (Ch1 upper, Ch2 lower.)
5. Set if you are using an IRO CAN feeder
6. Press Save if save icon (6) is orange

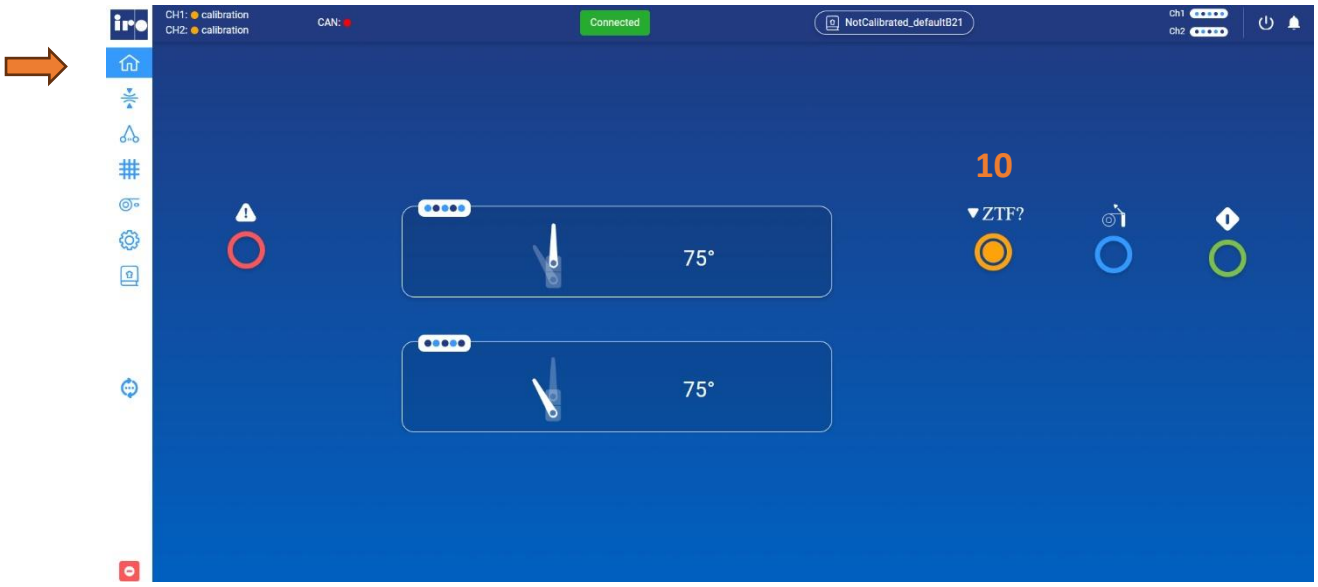
Brake settings:



Brake settings:

1. Zero Twist MUST be in attention mode (Red) to save.
   (security so no changes can be made during operation/run)
2. It is three separate brake zones, and they can overlap each other.
   (Zero Twist system takes only the highest value.)
3. Synchronized settings between Ch1 and Ch2 or individual between channels.
   (only on mix machine)
4. Set brake force.
5. Set start and stop angle (On/OFF)
   Most important is then the gripper release the yarn on right side
6. Grafe to overview settings.
7. Press Save if save icon (5) is orange

Start page: Zero Twist Calibration



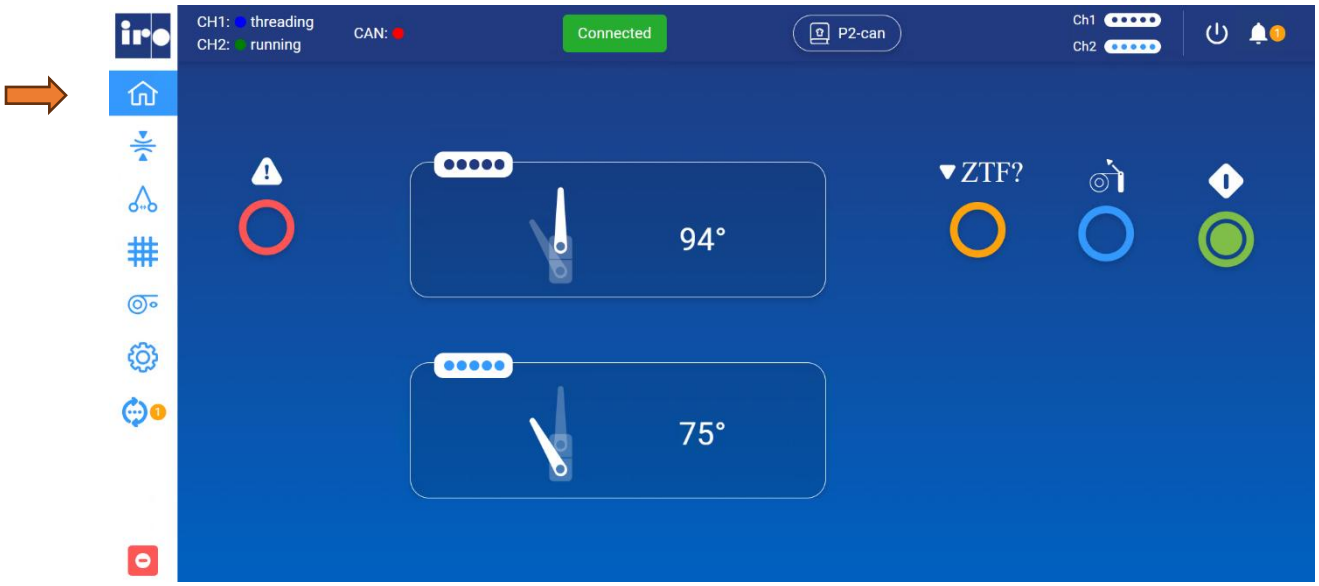
10 – Zero Twist Calibration: **Single mode**

1. Must be done when the Zero Twist is installed on a new loom or moved to another loom, also needed if article is changed.
2. Set the loom in the starting position.
3. Press orange ring and wait for steady orange light.
4. When the lamp is steady, do a manual insert on the loom by holding down slow-motion button a full 360° insert. Orange light starts flashing then inserting.
5. Wait for the next stable orange lights. Repeat 2 times in single mode.
6. Zero Twist is ready then blue ring is lighting up.
7. Prepare loom and to go to Run mode (green) on Zero Twist.

10 – Zero Twist Calibration: **Mix mode**

1. Must be done when the Zero Twist is installed on a new loom or moved to another loom, also needed if article is changed.
2. Set the loom in the starting position and look that color selector sensor is active. Green LED light on HMI control box
3. Press orange ring and wait for steady orange light.
4. When the lamp is steady, do a manual insert on the loom by holding down slow-motion button a full 360° insert. Orange light starts flashing then inserting.
5. Wait for the next stable orange lights. Repeat 2 times / color in mix mode. (total 4 insert)
6. Zero Twist is ready then blue ring is lighting up.
7. Prepare loom and to go to Run mode (green) on Zero Twist.

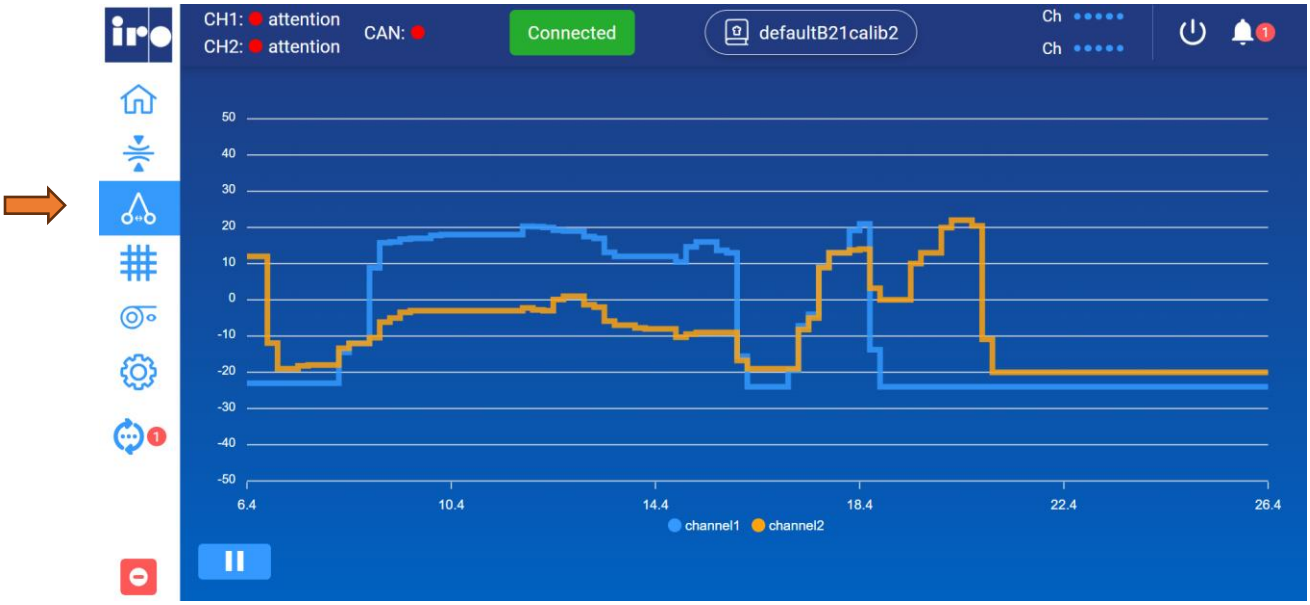
Start page: Run



Run mode: (Green)

1. Puch green button **before** starting the loom machine.
2. When the light flashes the Zero Twist is preparing to enter the run mode.
3. Solid green light, then Zero Twist ready to weave.
4. After stopping loom manually, the Zero Twist automatically goes back to Thread Up (Blue)

Sensor arm graph:



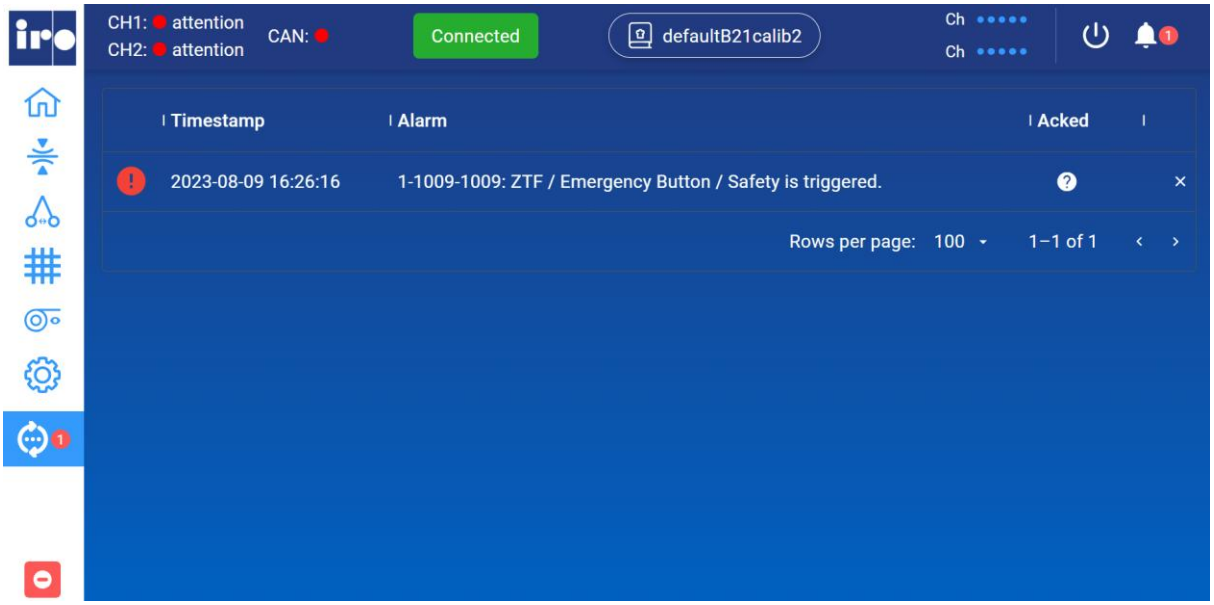
Sensor arm graph:

1. To see how sensor arm behaves.
   An aid if problems arise.
   If the graph goes upwards (approx. 30°), it indicates low yarn tension on the sensor arm, which means that too little yarn is delivered to the loom. If the graph goes downwards (approx. 30°) at start, it often indicates that the gripper missed the yarn.
   If it goes downwards at the end of the insert, it indicates wrong brake setting. Yarn is going back to Zero Twist and waste can be too short.

Yarn tension

2. The yarn tension can be set manually on the sensor arm with a screwdriver.
   For fast weaving machines the spring force needs to be high for the sensor arm to follow the fast speed changes of the yarn.

Alarm list:



Alarm list:

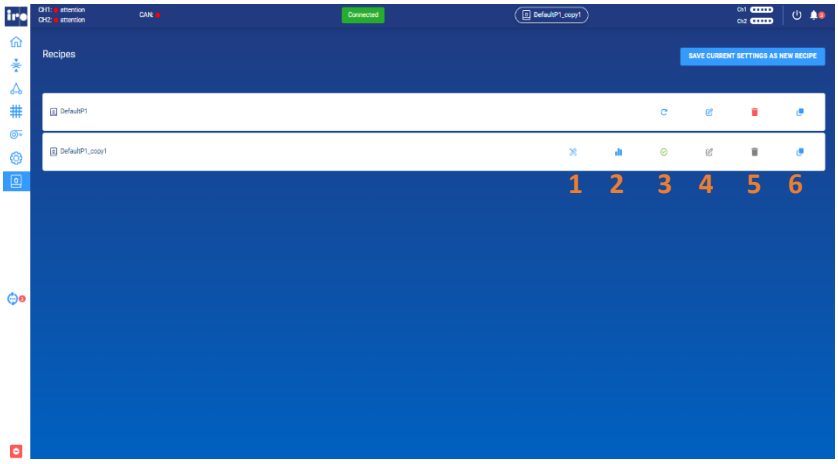
1. Different types of alarm can be seen here.

Weaving techniques page.

Password for weaving techniques:
User: root
Password: root

To see these pages, you must log in as Technician or VDW support.

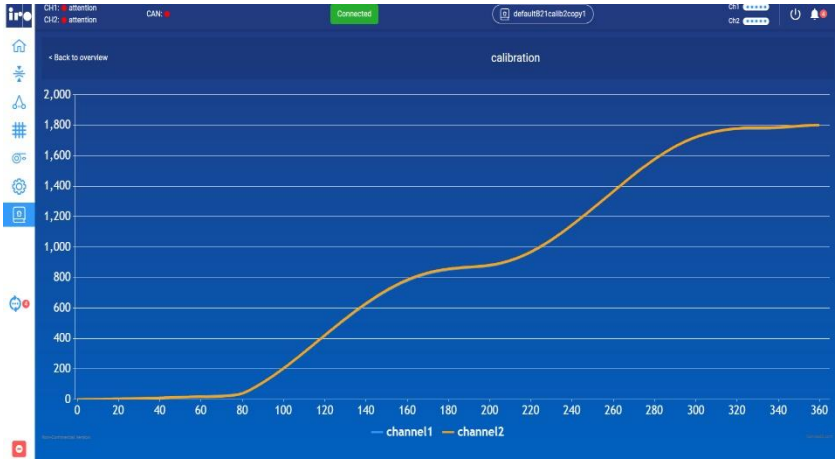
Recipes



Recipes:
Saved recipes can be loaded

1. Loade recipes
2. See Feed forward curve. Calibration curve that Zero Twist is following.
3. Indicate active recipes. Puch arrow to load saved recipes.
4. Rename recipes.
5. Delete recipes.
6. Duplicate recipes

Feed forward curve:

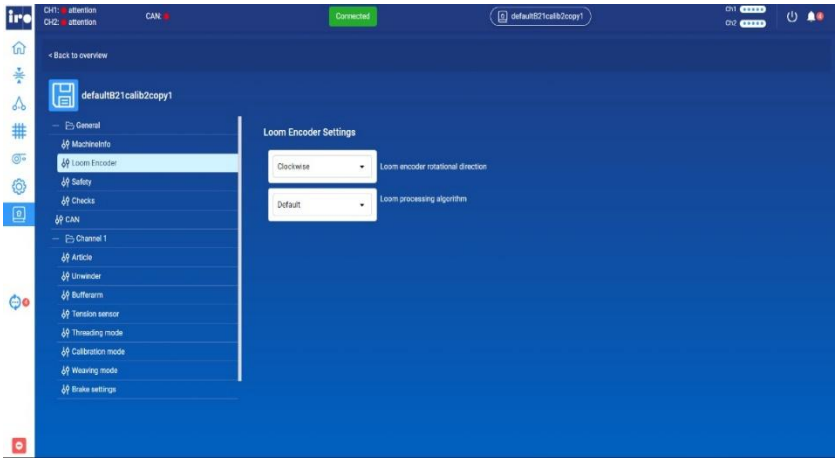


Feed forward curve:
You can see the saved calibration.

X-axel is loom angle.
Y-axel is yarn requirement.

Orange it Ch1
Blue is Ch2

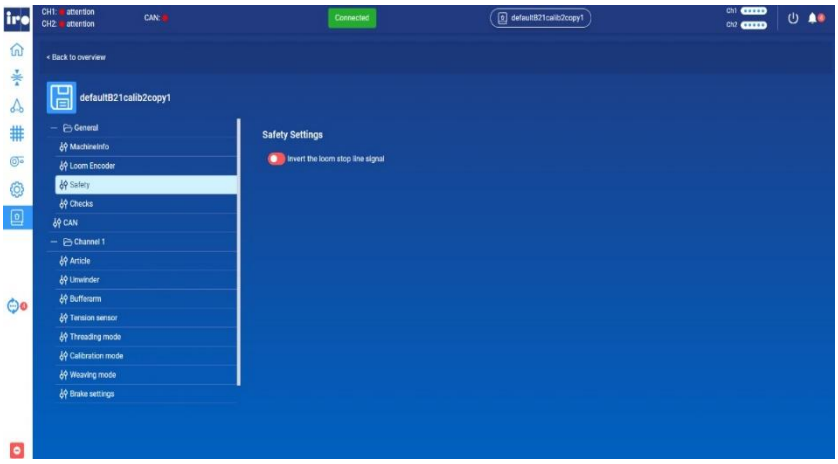
Encoder settings:



Encoder settings:
Possible to set encoder on left or right side of the loom.

Default:
Clockwise and right side of the loom.

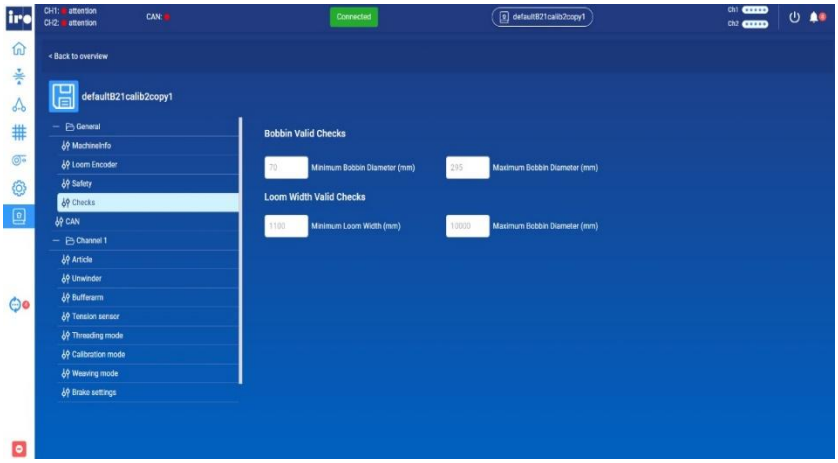
Loom stop line settings:



Loom stop line:
Possible to change loom stop signal from close to open.

Default:
Open

Dimensions:



Info:

Max dimensions on bobbins and loom

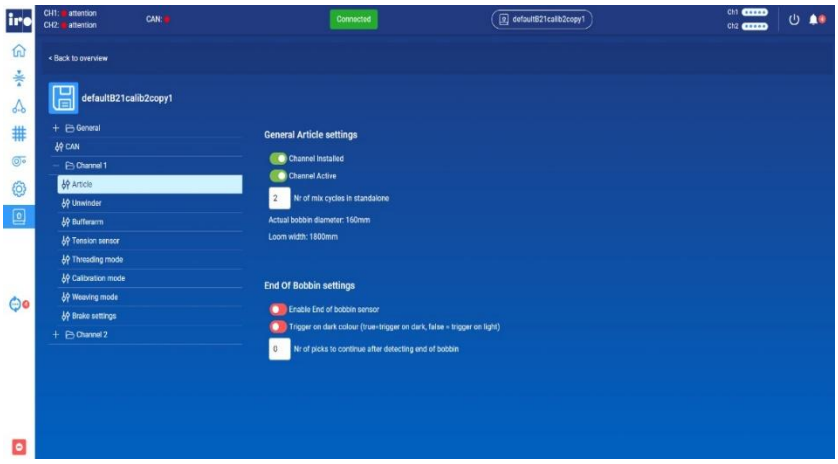
CAN Information:



Info about CAN:

CAN information

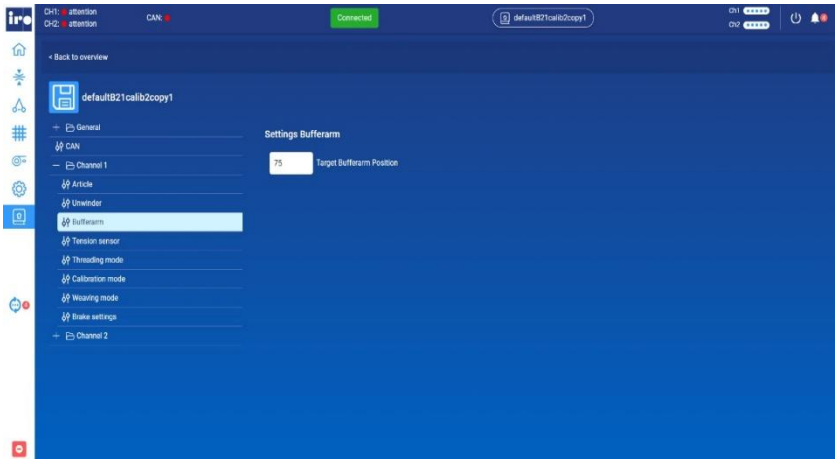
General article settings



Info:

Overview of settings

Bufferarm target position

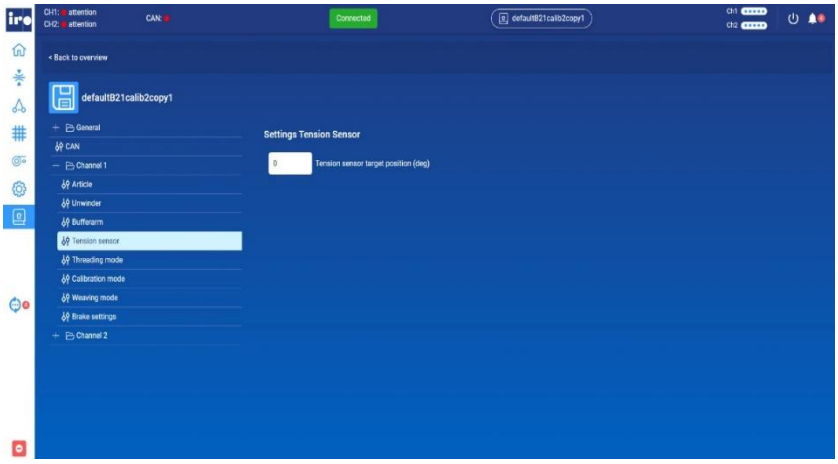


Buffer arm setting:

Is possible to change were bufferarm will have the center position then running.

Default: 75°

Sensorarm target position



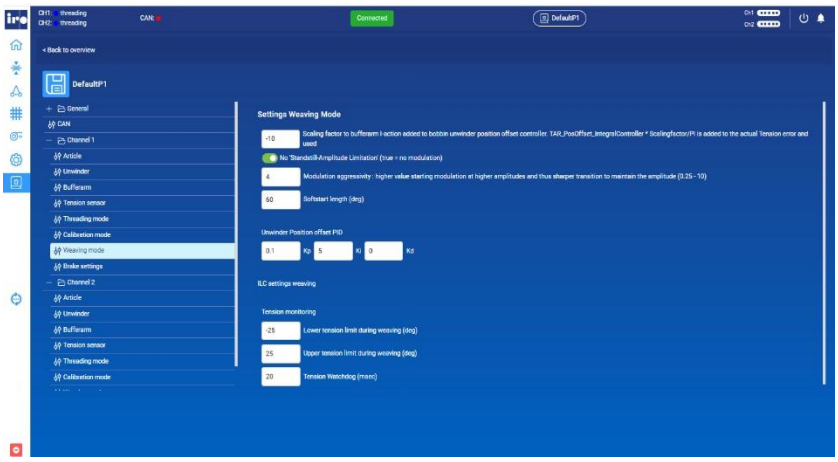
Sensorarm setting:

If loom have high speed or high peek tension, then it´s possible to move start position for the sensor arm little backwards to have some more margin for the first pick.

Move to minus (max-15)

Default: 0°

Treading mode

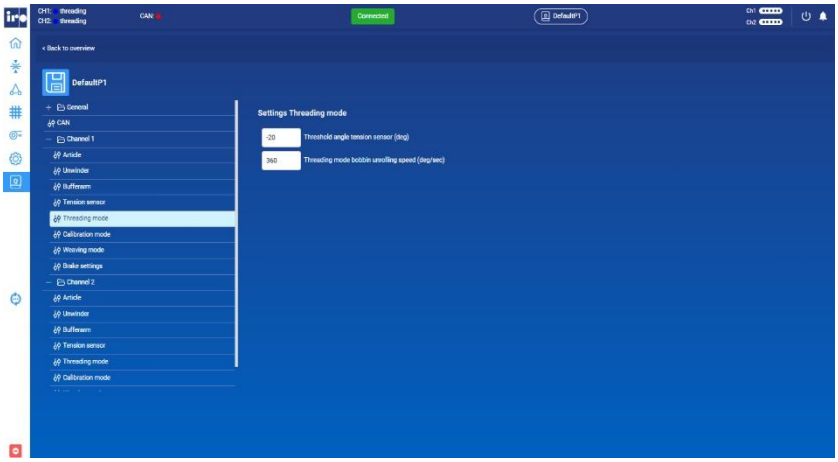


Treading mode:

Threshold angle:
Lover that if you have high peak at insert. Then ZTF have more time to react. (max -10°)

Threading mode:
Make the bobbin unroll faster in Thread Up

Weaving mode



Weaving mode setting:

The most important settings is
No “Standstill-Amplitude Limitation”
Controls the behavior between unwinding and bufferarm

For narrow looms (<1,5m) the slider must be on right side (green)

For looms bigger (>1,5 m) it´s better to have the slider on left side.

The next thing to change is Modulation aggressivity

Brake settings

Service

The ZTF needs regular cleaning from dust and fiber. Special attention to the yarn deviation points at the buffer arm and the sensor arm. There are two versions:

1. Roller with bearing to be used for sticky or high friction yarns. This version limits the speed due to the extra inertia. The bearings and rollers need cleaning and if worn out replacement. Check up regularly.
2. Low inertial version with friction against the yarn. To be used for high speed and yarns or tapes with low friction. May be subject to wear and needs regular check- up.

Wear parts

The ZTF contains wear parts such as bearings and rollers or friction deviation points for the buffer arm and sensor arm. The bearings for motors and gear might be contaminated by dust. Check this regularly. Also check the dust protection that is assembled in front of the bearings. Exchange parts with IRO original when necessary.

Fault finding

Issue	**Look at**	**Try**
Lost yarn during infeed	*Waist in gripper *Low tension on gripper (right and left) *Selvedge is not holding the yarn. *Transfer is not optimized (Can be speed related) *High tension on sensor arm. *Low brake settings *Wrong Loom angle in HMI	*Clean *Increase tension in gripper head *Close selvedge earlier or release right gripper later. *Check that transfer is good *Measure tension on Sensorarm (Selvedge, fabric and any brake have to hold the same force that sensor arm have) *Adjust brake settings in HMI *Check that you have right loom angle
Difficult to pull yarn in Thread Up	*Look in HMI for settings of Threading mode	*Logg in as technique Go to Channel/Threading mode. Increase unrolling speed. *
Calibration	*Not able to get a stable orange light *Lost yarn during infeed	*Are color selectors active. Move loom to start position *See point: Lost yarn during infeed
CAN	*No Zero Twist feeder in Dornier control panel *Is CAN activated and saved in HMI before Dornier loom was started	*Zero Twist must be started before Dornier loom. *Is the jumper installed on ROJ CAN Control Box or an IRO feeder
The fuse blows when starting Zero Twist	*Wrong fuse	*See technical specification for fuse recommendation from Beckhoff

- Carbon fibers are electrically conductive which can cause short circuits in the electrical cabinet. If the cabinet needs to be opened, the Zero Twist shall be cleaned from dust and then moved to another room, which hasn't been subjected to carbon fiber dust. Before opening, clean the Zero Twist with a wet cloth.
- If the buffer arm during stand still is positioned at a very low level (near horizontal) it might block the start. In that case, open the lid and move the arm manually to a vertical position.
- If the lid is opened during running the power to the drivers is switched off. The bobbin will then roll out and until it stops it might wind up yarn backwards. Before starting, make sure that the yarn is properly wound on the bobbin and in the right direction. (see page 11)
  Same situation is valid if the power to the ZTF is broken during running.
- A new calibration must be performed for each new article.



WARNING!

At all service: Switch off mains supply. Use proper personal protection gears. Note that carbon fiber, glass fiber and similar might be a risk for health

Declaration of conformity

EC DCLARATION OF CONFORMITY

Vandewiele Sweden AB
Box 54

SE-523 22 Ulricehamn

Guarantee that machine type:

ZTF-1034 Tape, single channel.
ZTF-1134 Tape, dual channel.
ZTF-1234 Carbon, single channel.
ZTF-1334 Carbon, dual channel.

Is manufactured in conformity with the provisions of the following
EC directives and applicable amendments.

		Standard used to verify the compliance
Safety of machinery	2006/42/EC	EN ISO 111 11-1 2016 EN ISO 111 11-6 2005
Low voltage equipment	2014/35/EC	EN ISO 111 11-1 2016 EN ISO 111 11-6 2005
Electromagnetic compatibilit	y2014/30/EC	Immunity: EN 6100-6-2:2005 Emission: EN 6100-6-4:2007 +A:2011

Pär Josefsson, Manager Product and Development department, 2019-10-28

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