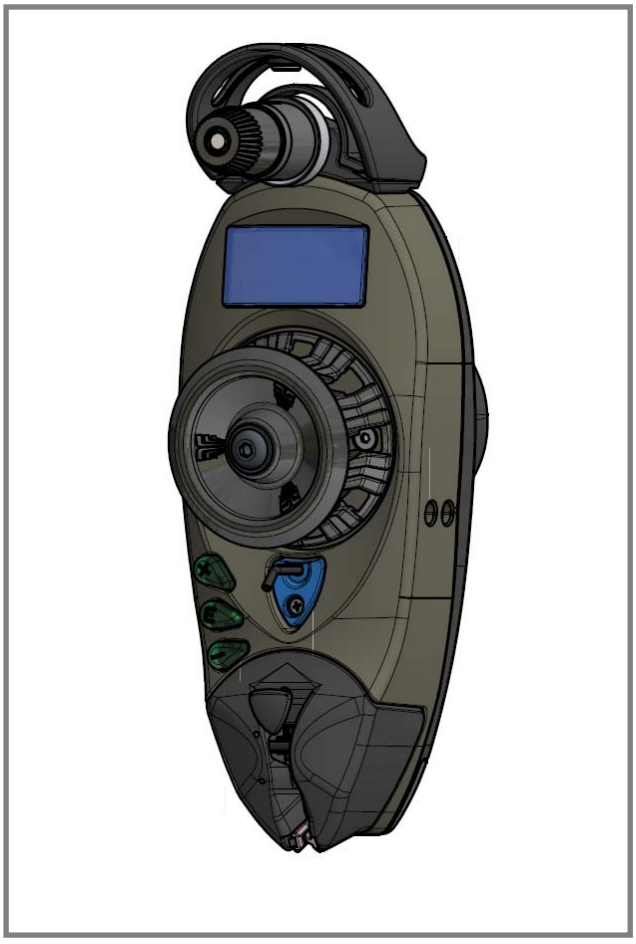
ULTRAFEEDER 2

YARN CONTROL SYSTEM



Operating Manual

ENGLISH

Rev. 1.1 – October 2016

ULTRAFEEDER 2 – Rev. 1.1 – October 2016

This manual is intended for the users of **ULTRAFEEDER 2** yarn feeding devices. It is suggested to carefully read the instruction reported in this manual before making the connections and use the system.

BTSR reserves the right to change at any time the contents of this manual, without notice.

For any technical or commercial problem, please contact your local BTSR dealer or call directly BTSR customer service centre. We will be glad to meet your needs.

Thank you for your trust and good job.

CE

The product described herein is compliant with the requirements of ***Machinery Directive 2006/42/CE*** and of ***EMC 2004/108/EC Directive***

All BTSR products are covered by patents and adopt exclusive, profitable and high tech. Solutions.

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INTRODUCTION

Congratulations for choosing a BTSR product.

With our **ULTRAFEEDER 2** yarn feeding devices, with or without the **SMART MATRIX PFU** terminal, you got an innovative, unique solution able to offer you multiple advantages concerning quality of your production.

The device that meets the current and future production needs

To meet the growing market requirements in terms of textile products which are requested to be more and more technical and highly qualitative at a competitive price, the textile industry must obviously use valuable yarns, i.e. bare or covered elastomers.

The high cost of these raw materials and their intrinsic difficulty of use during the production process push the textile industry to demand devices, instruments and control systems able to guarantee a high quality level of products as well as to strictly keep under control *(and optimize)* the amount of yarn used.

The **BTSR ULTRAFEEDER 2** control devices offer the possibility to control and adjust with extreme accuracy the yarn feeding tension, which is the main requirement to reach the quality and saving goals stated above.

The **ULTRAFEEDER 2** devices are in fact high precision measurement and control instruments providing a real time display of the exact yarn tension and guaranteeing, through an accurate adjustment, a constant yarn tension in every working condition. This occurs independently of the speed at which the textile machine is running *(either high or low speed)* and the tension is kept constant even when the yarn package tension is subject to change due to environment conditions such as humidity, temperature, etc., or when the yarn packages are gradually emptying during the normal working process.

It is known that the yarn tension variation, due to the progressive yarn package emptying, considerably affect the amount of yarn used by the machine.

This decreases the quality level of the product, increasing the actual yarn consumption affecting the production costs and reducing the efficiency of the machine production (*yarn breakages).*

The **ULTRAFEEDER 2** devices are fully programmable and can easily being adapted to work any kind of yarn and tension adjustment. Furthermore, these devices are manufactured using very high quality and precision electronic components, guaranteeing an exact displaying of the yarn tension as well as an accurate real-time control of the tension itself, all features that make it unique.

How to use this manual

This Operation Manual is subdivided into 4 Chapters and an Appendix.

Chapter 1 – Overview describes the main features, components and the operation principle of ULTRAFEEDER 2 devices.

Chapter 2 – Technical Data and Installation gives the necessary instructions to install the devices with or without the PFU/64FS or PFU/2S power supply.

Chapter 3 – Operation gives a detailed description of the necessary operations to setup and program the ULTRAFEEDER 2 devices according to the application needs.

Chapter 4 – Troubleshooting and Maintenance provides a quick guide to solving the main failures of ULTRAFEEDER 2 devices.

Appendix – provides the necessary information for the firmware upgrade on the interface/power supply PFU/64FS boards.

Symbols used

☞ *Highlights notes, warnings and subjects to which the attention of the reader should be directed.*

⚠ Indicates a particularly sensitive situation which could have an effect on the safety or proper operation of the system.

P1.2 **TENSION ERROR**

All the items concerning the device programming menus, within this manual, are always show in **CAPITAL BOLD** letters.

Reference Documentation

For further operating details about the programming/analysis and monitoring systems available for ULTRAFEEDER 2 device management, please refer to the following BTSR manuals.

SMART MATRIX PFU Manual – Rev. 1.0 – Ed. 02/2016
Rolling FEEDER/MED Manual – Rev. 3.0 – Ed. 05/2012
PC-LINK EASY CHAIN Manual – Rev. 1.0 – Ed. 04/2016
PC-LINK NEMO PROFILER Manual – Rev. 1.0 – Ed. 03/2012
PFU/64FS SYSTEM Manual

CE Conformity Declaration

(in accordance with the relevant European Directives)

Hereunder is reported a summary of the Conformity Statement, with which

BTSR SpA Via Santa Rita
21057 OLGIATE OLONA*(VA)* – ITALY
Telephone: (++39 0331 323 202)
Telefax: (++39 0331 323 282)

declares under its own responsibility that the following equipment:

Type:	*yarn feeding device*
Model:	*ULTRAFEEDER 2*
Intended Use:	*Yarn feeding and control on various types of textile machines*

complies with the prescriptions of the following Directives:

- 2006/42/EC concerning the Safety of Machinery.
- 2014/30/UE concerning to the Electromagnetic Compatibility

and that for its design, manufacturing and verification the principles and concepts introduced by the applicable paragraphs of the following Harmonized Standards were adopted:

- UNI EN ISO 12100:2010
- EN ISO13849-1:2015
- EN ISO13849-2:2012
- EN 61326-1:2012
- EN 60204-1:2006/AC:2010
- EN 61000-6-4:2007
- EN 61000-6-2:2005

The person authorized to collect the Technical File is:
Ing. M. Tomazzolli - info@btsr.com

☞ *The above indications are purely for information purposes and should not be considered as an alias of the actual conformity statement subscribed and released by the Manufacturer.*

COMPLIANCE WITH EUROPEAN DIRECTIVES AND STANDARDS

The BTSR equipment comply with the safety requirements provided by Machinery Directive 2006/42/CE and with the Electromagnetic Compatibility requirement provided by EMC Directive 2014/30/UE.

During the design and manufacturing stages of BTSR equipment, the relevant paragraphs of the following Harmonized Standards have also been used as reference and guide line.

Applicable Directives

Machinery Directive	2006/42/CE	from 29/12/2009
Electromagnetic Compatibility Directive	2014/30/UE	from 20/04/2016

Main Harmonized Standards Applied

Safety of machinery - General principles for design - Risk assessment and risk reduction	EN ISO 12100:2010
Electromagnetic compatibility (EMC). Part 6-2: Generic standards - Immunity for industrial environments.	EN 61000-6-2:2005
Electromagnetic compatibility (EMC). Part 6-4: Generic standards - Emission standard for industrial environments.	EN 61000-6-4:2007
Electrical equipment for measurement, control and laboratory use - EMC requirements -- Part 1: General requirements	EN 61326-1:2012
Safety of machinery. Electrical equipment of machines. Part 1: General requirements.	EN 60204-1:2006/AC:2010
Safety of machinery. Safety-related pars of control systems. Part 1: General principles for design.	EN ISO13849-1:2015
Safety of machinery. Safety-related pars of control systems. Part 2: Validation.	EN ISO13849-2:2012

Noise Levels

The ULTRAFEEDER 2devices have been designed and manufactured to reduce the noise to minimum levels during operation. Weighted A acoustic pressure level generated by the machine and measured (*following the criteria defined by the standards in force*) at the operator working zones, during normal operation, is less than 70 db (A)

SAFETY AND RELIABILITY OF CONTROL SYSTEMS

Within the ULTRAFEEDER 2 device, the only safety control system (*motor locking prior to carry out the threading operation*) has been implemented according to the principles of the Harmonized Norm EN ISO 13849-1:2015. The following table shows the values of Category and of Performance Level (PL) implemented (*with respect to the Required Performance Level (PLr) resulting from the risk assessment*).

The PL calculation has been carried out by means of the “SISTEMA” (IFA) software.

Safety function	**Category**	**PL**	**PLr**
Wheel motor safety stop during the threading operation.	1	b	b

The PL value calculation and the relevant “SISTEMA” report are included within the Technical File of the ULTRAFEEDER 2 device.

1 - OVERVIEW

System Components

The **ULTRAFEEDER 2** devices can be programmed and used either in individual and autonomous way, or they can be connected to a control/programming **SMART MATRIX** terminal, thus obtaining a **complete system** providing further levels of analysis, adjustment, control and speed-up of production cycles, as well as statistical data processing, particularly useful to reach the quality and saving goals stated in the Introduction of this manual.

The **ULTRAFEEDER 2** devices can be used in a Master/Slave configuration, both as indicated on page 2.21 and in combination with other BTSR devices (**ROLLING FEEDER / ROLLING MED**).

Moreover, using a Personal Computer or Notebook with the aid of PC-LINK EASY CHAIN software running under Windows™ environment, you can implement an efficient analysis & monitoring system which allows you to find and correct even the minimum critical conditions and behavior differences among the various devices.

Main FEATURES of ULTRAFEEDER 2 Devices

Full Digital Technology

The ULTRAFEEDER 2 device is a fully digital instrument with high technological content which allows the setting and control of the yarn tension to which you want to work. The setting is done via three keys and a graphic LCD display.

In normal operating conditions the LCD provides a real time display of the exact yarn tension *(in grams)* during manufacturing process, the yarn consumption speed *(LFA) (in m/min*), the quality index QI of the device and in graphical form, both the average and peak values of the yarn tension.

The ULTRAFEEDER 2 devices are controlled by two DSPs *(Digital Signal Processor)* and by ASIC components *(BTSR patent)* which provide great versatility *(parameters programmed according on the various yarn working conditions)*

The Full Digital Technology also allows performing a number of extremely accurate controls on the device motor *(absorbed current, speed, motor angular position, etc.).*

Temperature control

The operator may check at any time the internal temperature *(in °C)* of both control board and motor, pressing the  key.

An excessive increasing of the temperature might indicate a wrong use of the device; for this reason, the device's software performs a continuous monitoring of the internal temperature

If these temperatures exceed the maximum pre-defined value, an alarm message (ERROR °C) appears in the graphic area of LCD, and the Stop output is activated.

Safety

Thanks to a programmable protection code, all parameters can only be changed by authorized personnel who knows this safety code.

External control

The ULTRAFEEDER2 device may easily be programmed also using the SMART MATRIX PFU terminal (*or others BTSR programming terminals*) which, thanks to its flexibility, allows faster programming of many devices. Once has been created a style on the SMART MATRIX PFU terminal, you can use and load these programming data even on devices in use on other machines in times of around one second per machine (*the time required to transfer data).*

Easy to install and manage

The ULTRAFEEDER 2 is a space saving device *(187 x 94 x 65 mm).* This allows you to install several devices on the same machine with limited footprint. The device has been designed taking into account not just the technological aspects, but also the ergonomic ones. Thanks to these features, the device can be perfectly integrated with the machine structure, without affecting the machine spaces needed for the machine operator.

Usable with any type of yarn

The ULTRAFEEDER 2 device can work with a wide range of yarns, including very thin yarns such as bare and covered elastomers, always guaranteeing a perfect control of yarn tension values chosen by the user, which results in a high quality of the manufactured product.

The ULTRAFEEDER 2 device considerably reduces the preparation tasks, thanks to a single self-threading ceramic eyelet that makes the operator job easier.

The tension value displayed on ULTRAFEEDER 2 device LCD indicates the real yarn tension with which the device is working. This guarantees a constant and accurate monitoring of the working process.

Easy to program

Possibility of viewing and selecting directly from the device menu the desired application *(socks, pantyhose, seamless, medical socks, raschel, etc..)* without manually setting the related parameters.

Improved performance

With respect to the previous ULTRAFEEDER version, the new ULTRAFEEDER 2 provides a better hardware and software performance. A new type of motorization and a smaller wheel slightly sloping, allow an easy management of the various yarn types and a better yarn separation.

Moreover the inlet accessory is provided with adjustable bush according to the yarn incoming direction.

Advantages obtained by using the ULTRAFEEDER 2 devices

- Constant yarn tension both when the machine speed changes and when the yarn packages gradually get empty.
- Best efficiency by eliminating the yarn breakage *(tears and extratensions),* and possibility to work at the highest speed offered by the machine.
- Possibility to work with a wide range of yarn types including:
  - Very thin yarns, such as bare elastomers 11/15 DTEX.
  - Very difficult yarns, such as covered elastomers
  - Elasticized yarns either bare or covered
  - Nylon, cotton, etc.
- Yarn tension graduation capability, with 0.1 g. resolution *(INC/DEC function - BTSR Patent).*
- Finished product quality optimization thanks to the Master/Slave operating mode (*BTSR patent*)
- Accurate yarn feeding speed measurement *(1 to 1500 m/min) – (LFA m/min = Length of Absorbed Yarn).*
- Optimization of yarn consumption and less difficulties to keep the correct size of manufactured products.
- Drastic reduction of yarn consumption *(8% to 15% for bare elastomers, 2% - 5% for covered elastomers).*
- Better quality of manufactured product *(defect free)* and drastic drop of second choice production.
- Constant keeping of set size, independently of the yarn package emptying condition.
- Possibility to use the yarn up to the complete package emptying.
- Better machine efficiency.
- Possibility to feed the strap elastic or wrist band, guaranteeing a constant compression *(hosiery machines).*
- Possibility to perform gradual compression with no limits, and with a minimum resolution of 0.1 grams.
- Efficiency optimization on machines that use the yarn in non-continuous mode (Start-Stop), thanks to the possibility to draw back immediately the yarn fed in excess *(“reverse" applications)*.
- Full control of yarn presence, even during the “LEARN” phase performed with the SMART MATRIX PFU control terminal *(“reverse" applications)*.
- Possibility to find the best application conditions of ULTRAFEEDER 2 device: *(No of coils to be wound around the roller, ideal programming values for parameters etc),* thanks to the continuous visualization, in graphic form, of both average and peak values of yarn tension.

Advantages obtained by using the SMART MATRIX PFU Terminal combined with ULTRAFEEDER 2 Devices

- Using the SMART MATRIX PFU terminal connected to ULTRAFEEDER 2 devices you have the possibility to develop a wide range of functions which facilitate the practical use of the installed ULTRAFEEDER 2s *(immediate download and upload of data)*, as well as displaying fundamental data such as, yarn consumption and yarn tension.
- Possibility to create up an "article" database, saving them into the Data Base for an easy recall. Without the need to setup new parameters, these will simply be called from the Data Base and subsequently transferred to the ULTRAFEEDER 2 devices installed on textile machine.
- Possibility to control and quickly correct the stitch adjustments, thus eliminating the defects due to unbalanced stitch consumption.
- Possibility to identify the connected ULTRAFEEDER 2 devices, using an automatic numbering procedure *(BTSR Patent).*
- Monitoring and controlling possibilities of yarn consumption of the item in production, by means of the **CONTROL** function.
  In **CONTROL** environment, it's possible to run the self-learning procedure for the yarn consumption (***LEARN***) (BTSR Patent) of the machine during a sample cycle and then constantly check that the amount of absorbed yarn (LFA), during the next production cycles, remains within the programmable tolerance range by stopping the machine in event of deviations from this range *(+ and -)*.

☞ *For more details, please refer to the SMART MATRIX PFU operating manual.*

Further Advantages obtained by using a PC or Notebook Connected to the ULTRAFEEDER 2 Devices via Serial Line

- Using the PC-LINK EASY CHAIN software or other application programs specifically developed by BTSR, it's possible to upgrade *(via serial line)* the ULTRAFEEDER 2 device firmware, without the need to physically replace the microprocessor. In addition, the PC-LINK EASY CHAIN software offers several analysis and monitoring facilities that make easier the adjustment of control parameters to the production managers.
- Possibility of displaying in real-time up to 4 control graphics related to as many **ULTRAFEEDER 2** devices.
- Possibility of displaying/saving and printing *(for each graphic)* up to 7 different control parameters *(working tension, min/max tension, motor torque, motor speed, input tension).*
- Possibility of checking in real time the efficiency of a **ULTRAFEEDER 2** device by comparing the yarn input tension (*not controlled*) with the output yarn tension fed by the **ULTRAFEEDER 2** device.
- Possibility of checking *(or comparing)* the results obtained with two different versions of device control firmware.

☞ *For more details, please refer to the PC-LINK EASY CHAIN Operating Manual.*

2 – TECHNICAL DATA AND INSTALLATION

Technical Features

ULTRAFEEDER 2 Device	
Power supply voltage	24 VDC ± 10%
Maximum absorption	0,2A *(during normal operation);* 1A *(under stress);* 6A *(at start-up)*
STOP Output	NPN Open Collector, 200 mA max.
Max. voltage *(INC/DEC inputs, STOP Output)*	30 VDC
Programmable yarn tension	0.2 ÷ 100,0 gr. *(resolution 0.1 gr.)*
Programmable alarms	0.1 ÷ 10 sec.
Integrated keypad	3 buttons + STOP red LEDs
Signaling	With LCD graphic display
Dimensions	187 x 94 x 65 mm
Operating temperature range	10° - 60 °C
Storage temperature	-25° - +85° C
Tension range	0 / full scale
Useful tension range	0% - 95% full scale
Max applicable tension	10 times the full scale value
Drift error (a)	0.05% / °C
Repeatability error (b)	0.5%
Max linearity error (c)	1% *(0 / full scale)*
Max error (a + b +c)	2%

SMART MATRIX PFU Terminal	
Power supply voltage	24 VDC ± 10%
Maximum absorption	100 mA
Dimensions	140 x 80 x 31 mm
Operating temperature range	10° - 60 °C
LCD graphic display	80 x 40 mm
Integrated Touch-pad	6 buttons + rotary selector
Protection	2 fuses – 1.5A

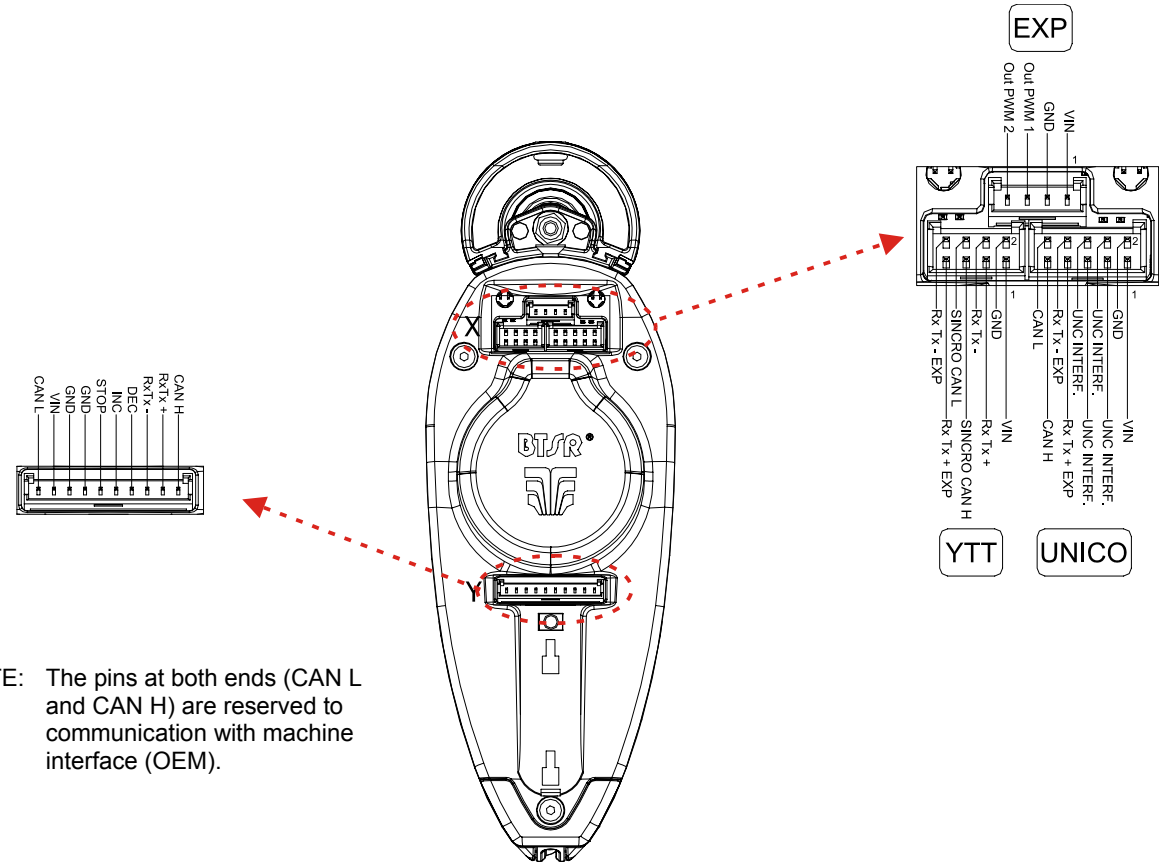
Power supply PFU/2S (8 outputs)	
Power supply voltage /+Vac IN	24 Vac +/- 20%
Output voltage group #1/VDC	24 VDC +/-5% (*standard*) 32 VDC +/-5% (*boost*)
Output voltage group #2/VDC	24 VDC +/-5% (*standard*) 32 VDC +/-5% (*boost*)
Output total current group #1 / VDC OUT	7A MAX (*continuous*)
Output total current group #2 / VDC OUT	7A MAX (*continuous*)
Input INC/DEC (Groups #1 and #2)	
Activation voltage	Min = 12 VDC/Max = 24 VDC
Input EXC “digital”	
Activation voltage	Min = 12 VDC/Max = 24 VDC
Input EXC “analog”	
Activation voltage	Min = 0 VDC/Max = 5 VDC
STOP output Groups #1 and #2 (contact specification)	1A – 120 VAC/24 VDC NPN

LED signals	POWER ON, EXC, INC, DEC, STOP (Group #1), STOP (Group #2)
Operating temperature range	+10° … +60 °C
Storage temperature	-25°… +85° C
Maximum dimension	120 x 65 x 30.5 mm

Power supply PFU/64FS (4 outputs)	
Power supply voltage /+VDC IN (IDC IN)	24 VDC – 32 VDC (100 mA MAX)
Output total current /VDC OUT1	7A MAX (*fuse protected*)
Output total current /VDC OUT2	7A MAX (*fuse protected*)
Output total current /VDC OUT3	500mA MAX for each output
Output total current /VDC OUT4	1500mA MAX (*fuse protected*)
Input characteristics (MC/SYNC; EXC; AST conn.)	
Activation voltage Threshold voltage Suitable for	0 – 24 VDC VIL Max 1,2 VDC – VIH Min 5 VDC NPN output devices
Input characteristics (EXC RF + / EXC RF - e EXC + / EXC -conn. only)	
Impedance Activation voltage Suitable for	1 KOhm min 5 VAC-DC / Max 24 VAC-DC NPN or PNP output devices
Output characteristics (EX STOP 1/2conn.)	
Maximum sink current Output type	100 mA (*fuse protected*) NPN
STOP Output characteristics	
Maximum sink current Output type	100 mA (*fuse protected*) NPN
Operating temperature range	+10° … +60 °C
Storage temperature	-25°… +85° C
Maximum dimension	95 x 124 x 65 mm

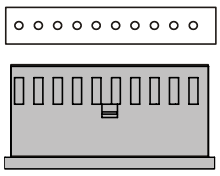
Expansion PFU/64FS (4 outputs)	
Power supply voltage /+VDC IN (IDC IN)	24 VDC – 32 VDC
Output total current /VDC OUT	7A MAX (*fuse protected*)
Input characteristics (EXC RF)	
Impedance Activation voltage Suitable for	1 KOhm min 5 VAC-DC / Max 24 VAC-D NPN or PNP output devices
INC DEC Input characteristics (MC/SYNC conn.)	
Activation voltage Threshold voltage Suitable for	0 – 24 VDC VIL Max 1,2 VDC – VIH Min 5 VDC NPN output devices
STOP Output characteristics (MC/SYNC conn.)	
Maximum sink current Output type	100 mA (*fuse protected*) NPN
STOP Output characteristics	
Maximum sink current Output type	100 mA (*fuse protected*) NPN
Operating temperature range	+10° … +60 °C
Storage temperature	-25°… +85° C
Maximum dimension	95 x 124 x 65 mm

ULTRAFEEDER 2 Device Electrical Interface

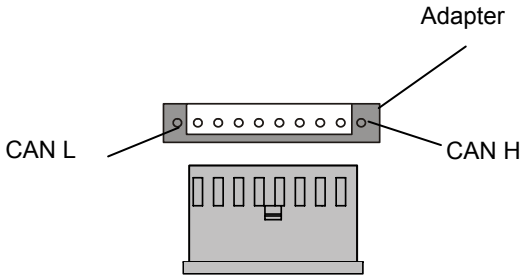


NOTE: The pins at both ends (CAN L and CAN H) are reserved to communication with machine interface (OEM).

The device is supplied complete with a special adapter cap which makes the connector fully compatible with the old KTF100HPS wiring. (CAN L and CAN H connections masked)



10 pin connector (without adapter)

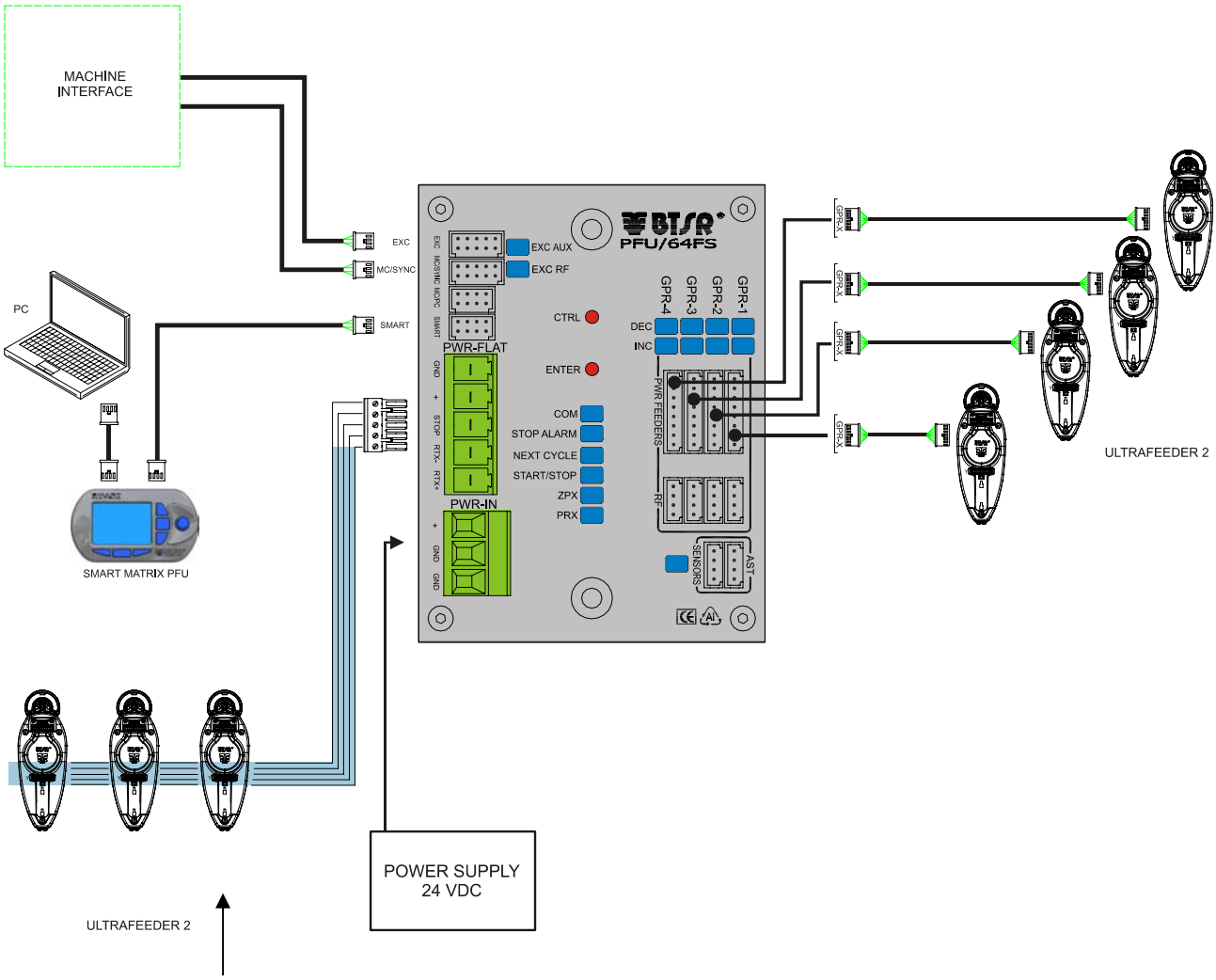


8 pin connector

EXP: connector available for future expansions
YTT: connector for YTT accessory and Master-Slave configuration
UNICO: connector for UNICO accessory

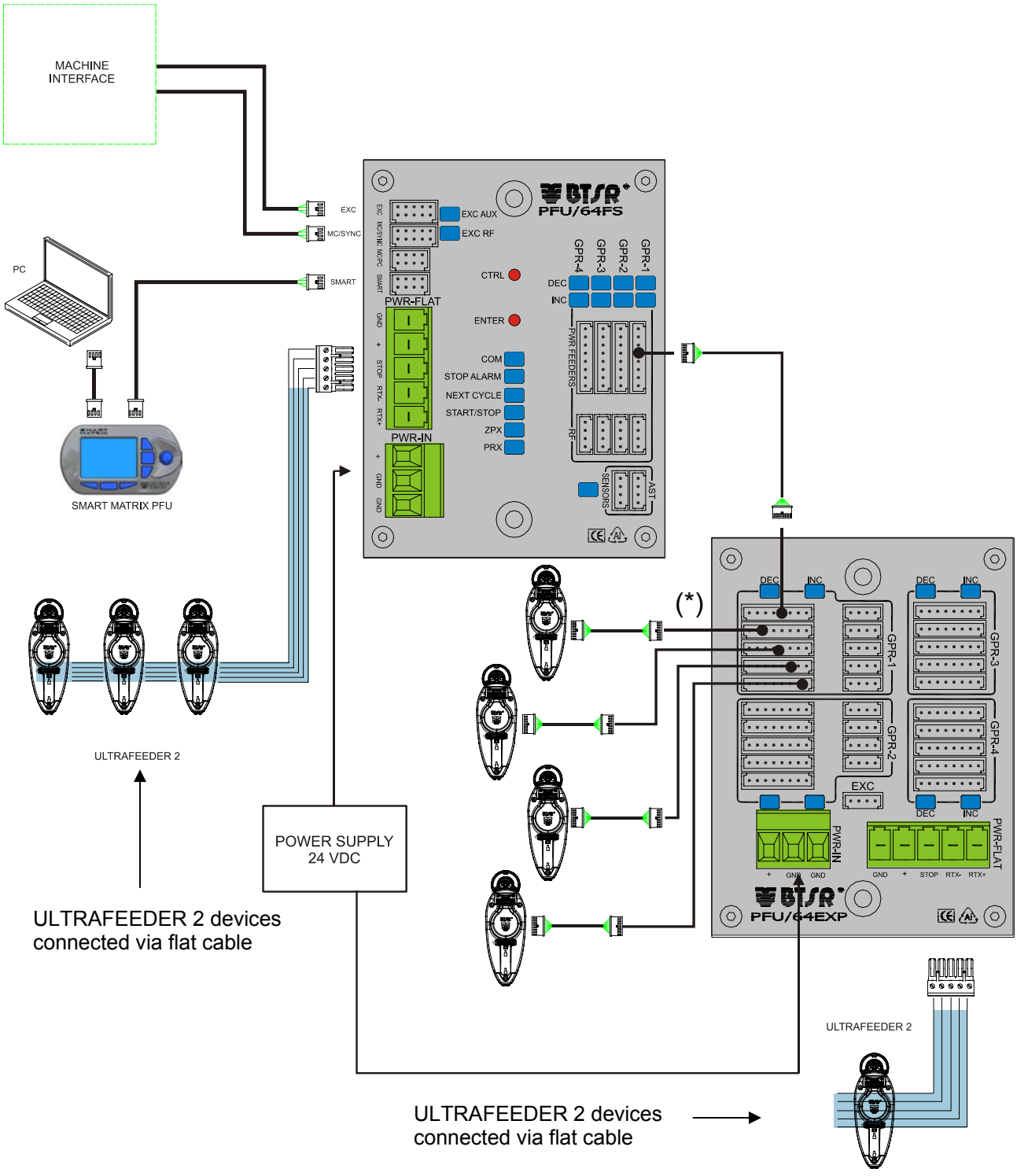
Installation of ULTRAFEEDER 2 with PFU/64FS power supplier

Connection Example of a Complete System including ULTRAFEEDER 2 Devices, PFU/64FS Power Supplier and SMART MATRIX PFU terminal



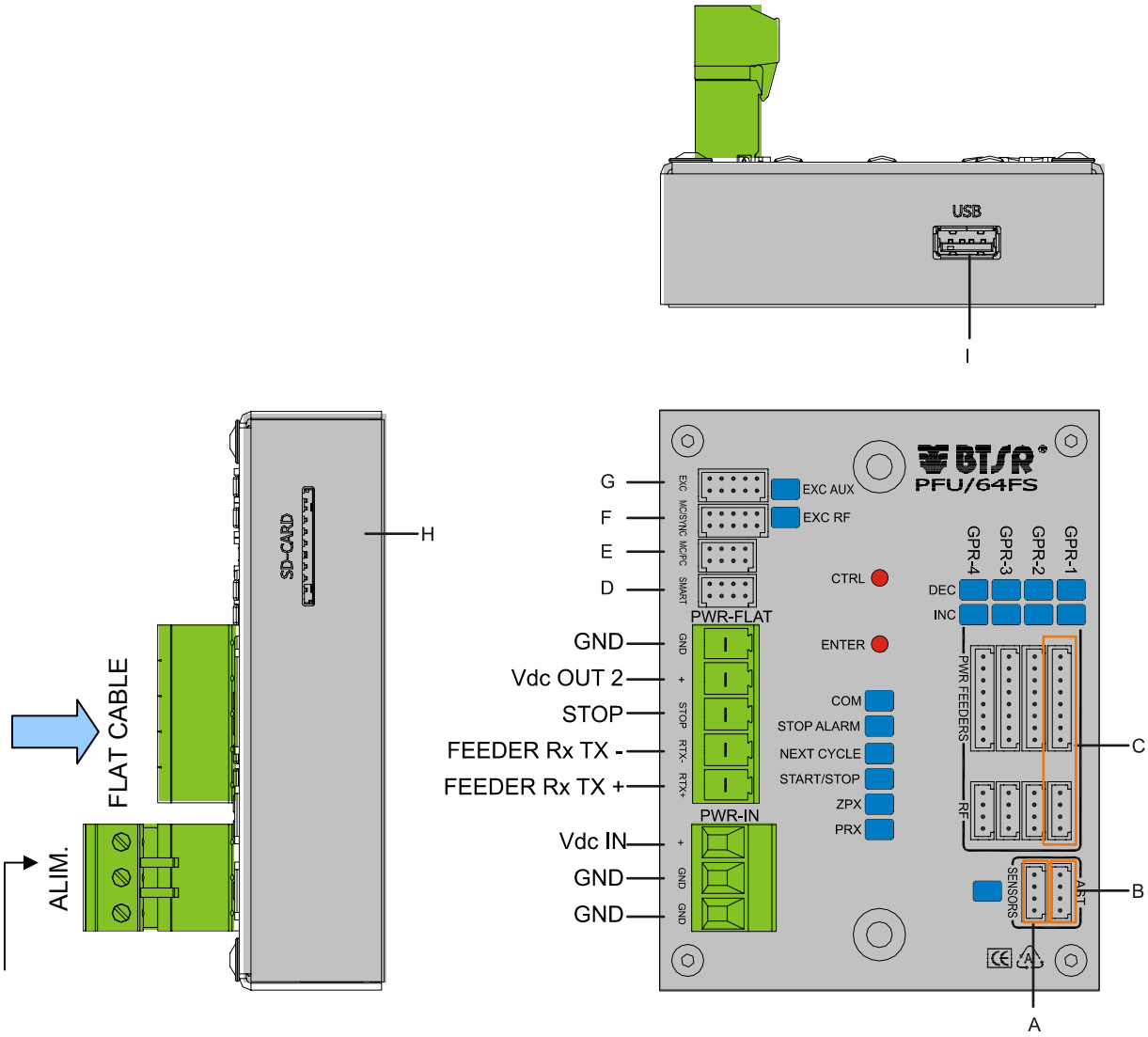
ULTRAFEEDER 2 devices connected via flat cable

Connection Example of a Complete System including ULTRAFEEDER 2 Devices, PFU/64FS Power Supplier, PFU/64EXP Expansion board and SMART MATRIX PFU terminal



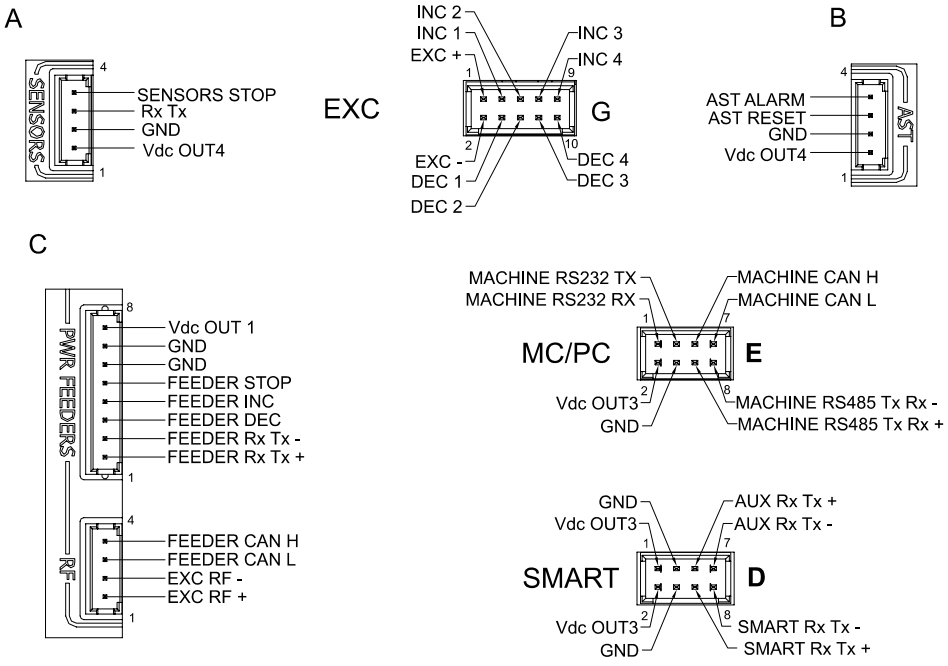
(*)The number of connectable ULTRAFEEDER 2 devices can be extended up to 64 by means of PFU/64EXP expansion boards cascading.

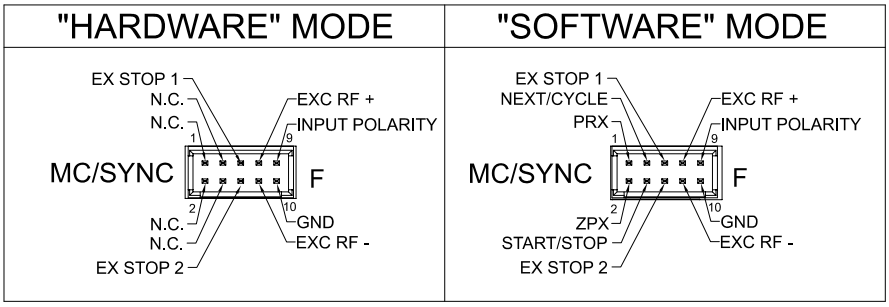
PFU/64FS power supplier electrical interface



The PIN assignment of A…G connectors is indicated on the following page.

The H (SD-CARD) and I (USB) connectors are used for firmware loading and/or upgrade, according to the desired configuration (see Appendix).





\+ *The difference between Hardware and Software Mode is described on the following paragraphs*

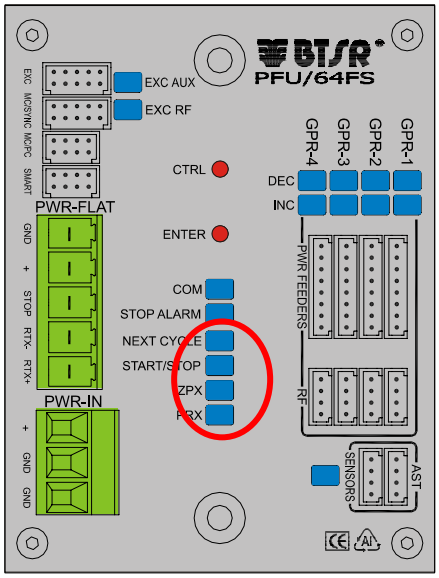
PFU/64FS configuration (*without SMART MATRIX PFU terminal)*

The PFU/64FS interface/power supply board can be configured to operate in 7 different modes, according to the application used (Note 1)

- **Software** Mode
- **Hardware 0** Mode
- **Hardware 1** Mode
- **Emulation 0** Mode
- **Emulation 1** Mode
- **Chain 0** Mode
- **Chain 1** Mode

Each operating mode has different features and a different I/O signal assignment on the board connectors.

The selected mode is indicated by the number of blinks of: NEXT CYCLE, START/STOP, ZPX, PRX LEDs (see next page)

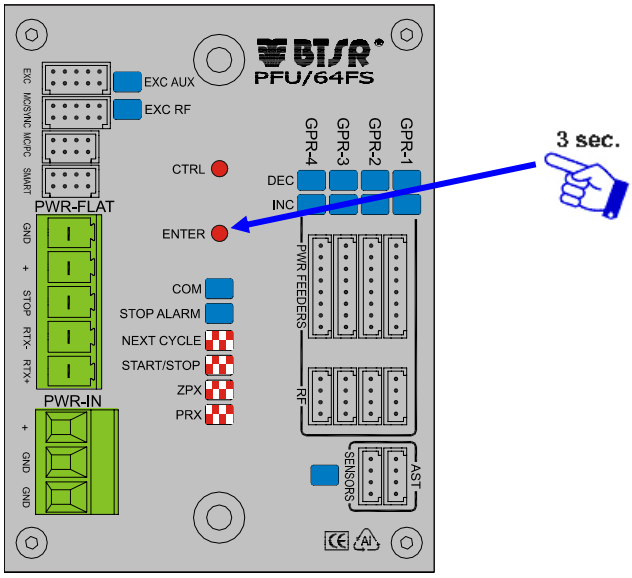


LED symbols

= LED OFF
= LED ON
= LED blinking

Note 1: to modify/upgrade the configuration, please refer to the appendix “PFU64/FS Firmware upgrade”.

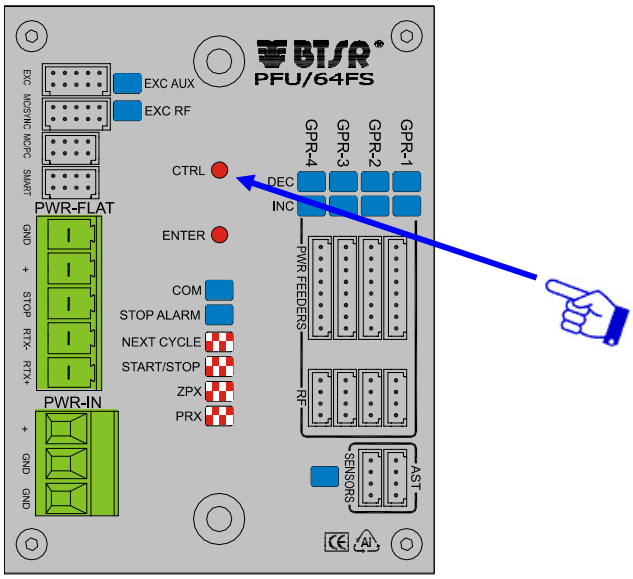
To select the desired mode, operate as follows:



Press and keep pressed for 3 seconds the ENTER key until the 4 lower LEDs start blinking.
The number of LED blinks indicates the currently selected mode:

- 1 blink = **software** mode
- 2 blinks = **hardware** 0 mode
- 3 blinks = **hardware** 1 mode
- 4 blinks = **emulation** 0 mode
- 5 blinks = **emulation** 1 mode
- 6 blinks = **chain** 0 mode
- 7 blinks = **chain** 1 mode

To change mode, operate as follows:

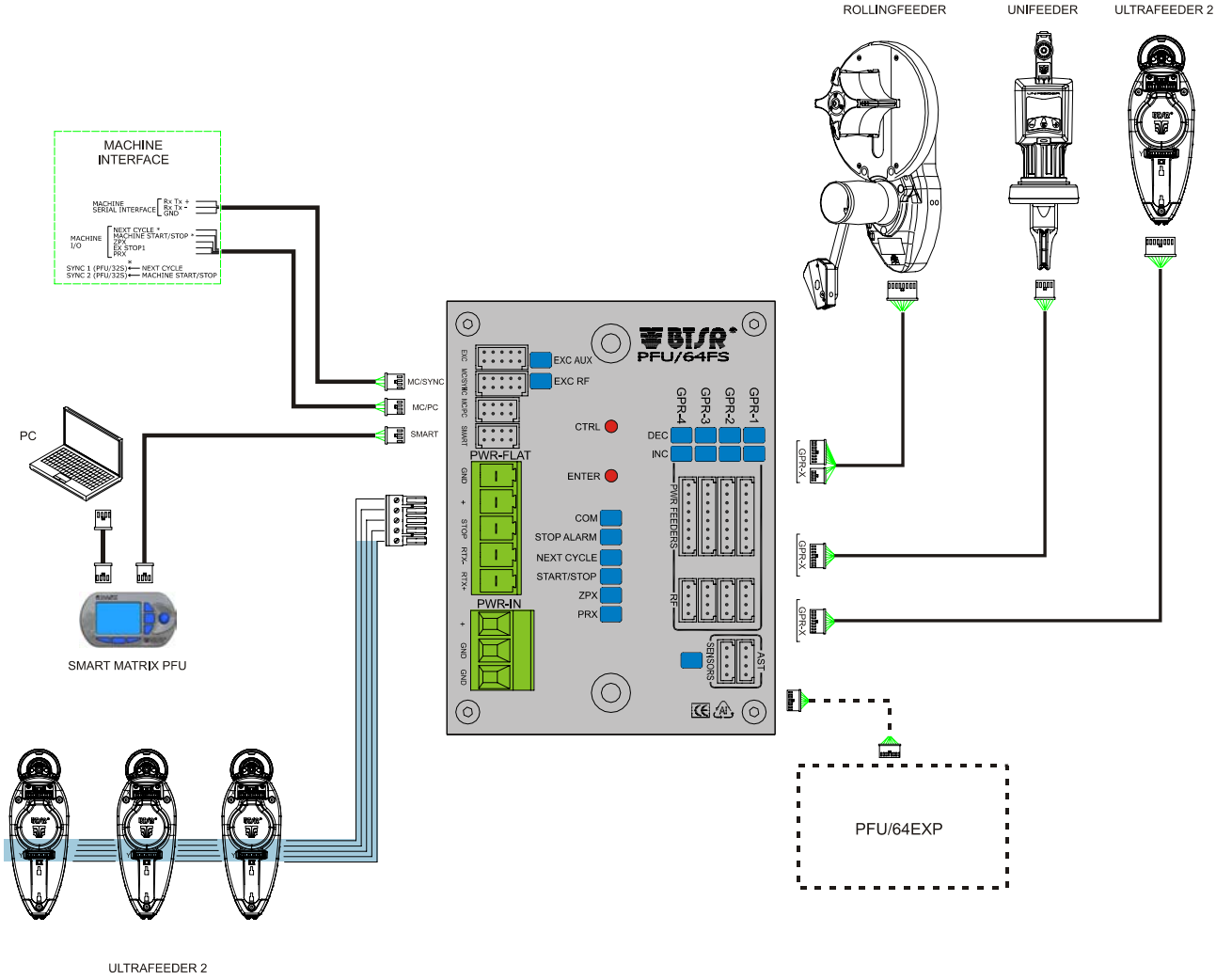


Press once or more times the CTRL key, until the number of blinks of the 4 LEDs matches the desired mode.

\+ *The operations described above, have to be run only in case is not used the SMART MATRIX PFU or any other BTSR programming terminal.*

PFU/64FS –Software Mode

This mode allows you to entirely manage the yarn feeders connected via serial communication line. This configuration is mainly focused for system integrators and applications using the PC LINK BTSR program family.



Here below are reported in details the available functions through the various machine interface connectors. For the Pin assignment, please refer to paragraph "**PFU/64FS power supplier electrical interface**" on page 2.10.

SMART connector

This connector makes available 2 serial lines:

SMART RxTx+	Serial line reserved for SMART MATRIX PFU terminal connection (communication speed 345600 Bps)
SMART RxTx-	
AUX RxTx+	Serial line reserved for communication with PC LINK BTSR software (communication speed 115200 Bps)
AUX RxTx-	

MC/PC connector
This connector provides the following signals according to the communication standard used:

MACHINE RS232 TX	Serial line reserved to OEM system integrators for RS232 communication (communication speed 115200 Bps)
MACHINE RS232 RX	
MACHINE RS485 Tx Rx +	Serial line reserved to OEM system integrators for RS485 communication (communication speed 115200 Bps)
MACHINE RS485 Tx Rx -	
MACHINE CAN H	BUS Can reserved to OEM system integrators (communication speed 1 MBps)
MACHINE CAN L	

MC/SYNC Connector
This connector provides the Hardware I/O signals for the machine synchronization:

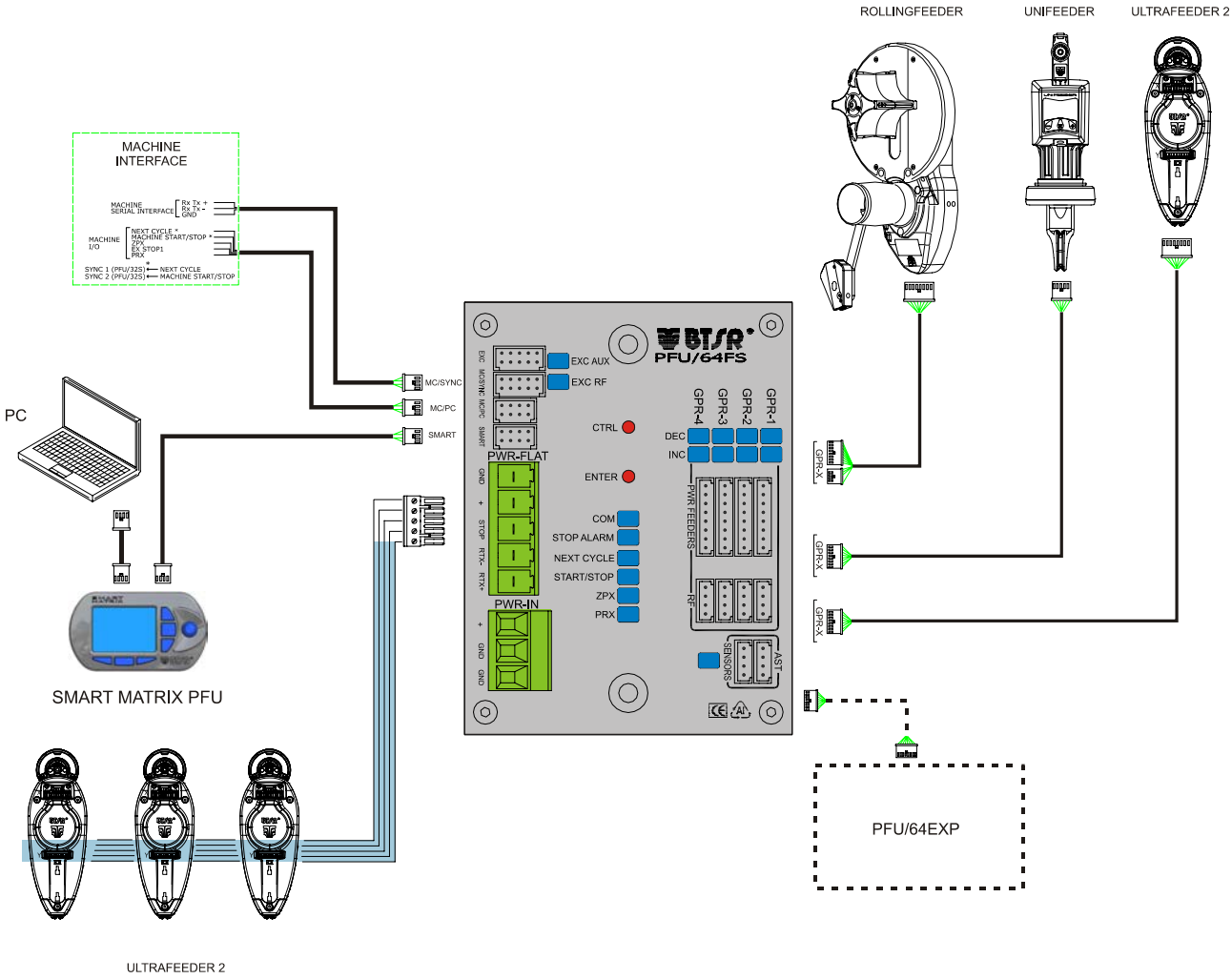
PRX	Cylinder rotation signals (1 or more pulses/rev)
ZPX	Hardware “Zero Chain” signal
NEXT CYCLE	“NEXT CYCLE” signal
START/STOP	“MACHINE START/STOP” signal
EX-STOP 1	Alarm signal (to the machine stop input)
EX-STOP 2	AUXILIARY STOP signal
EXC RF+	Positive OPTO-INSULATED signal for Rollingfeeder exclusion
EXC RF-	Negative OPTO-INSULATED signal for Rollingfeeder exclusion
INPUT POLARITY	Input lines PULL/UP and PULL/DOWN activation

EXC connector
This connector provides the Hardware I/O signals for control of FEEDER devices connected to Groups1-2-3-4.

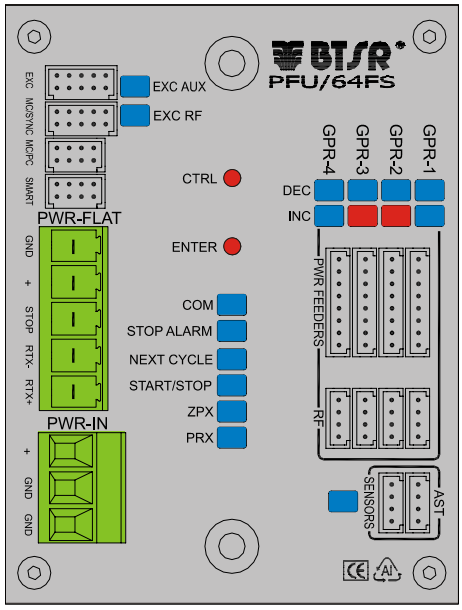
INC GRP 1	INC signals for Feeder devices connected to group GRP 1
DEC GRP 1	DEC signals for Feeder devices connected to group GRP 1
INC GRP 2	INC signals for Feeder devices connected to group GRP 2
DEC GRP 2	DEC signals for Feeder devices connected to group GRP 2
INC GRP 3	INC signals for Feeder devices connected to group GRP 3
DEC GRP 3	DEC signals for Feeder devices connected to group GRP 3
INC GRP 4	INC signals for Feeder devices connected to group GRP 4
DEC GRP4	DEC signals for Feeder devices connected to group GRP 4
EXC +	EXCLUSION SIGNAL OF ALL THE FEEDERS CONNECTED
EXC -	

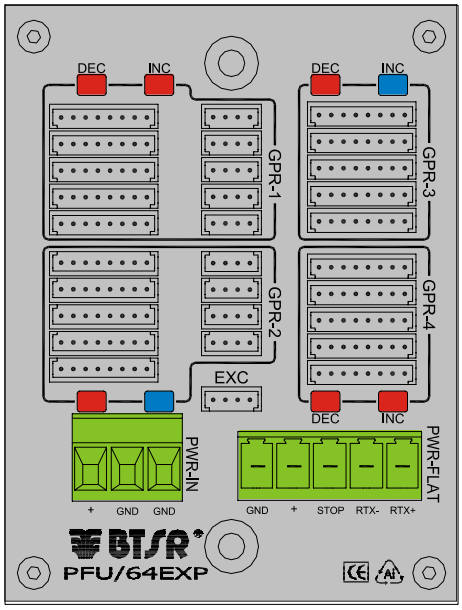
PFU/64FS –Hardware mode

This mode allows you to manage some functions of the yarn feeders connected through the I/O Hardware signals provided by the machine interface. In the Hardware operating mode, the INC/DEC signals for each Group are directly sent to the Feeder devices. Moreover, the Exclusion signal disables the INC/DEC functions.

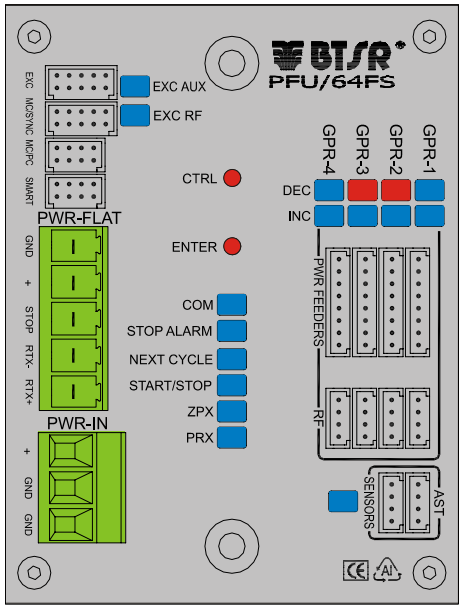


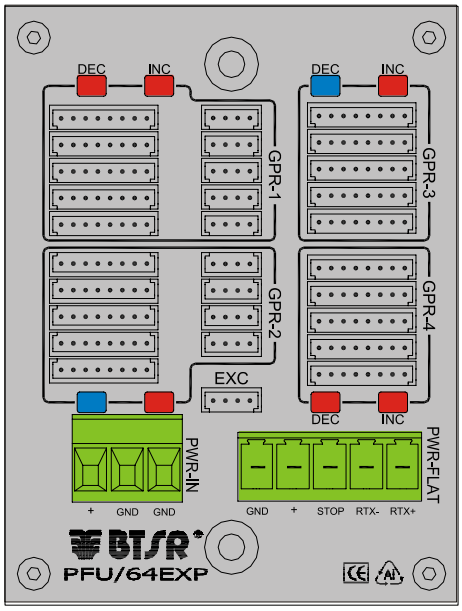
in Hardware mode, the INC / DEC LEDs indicate the activation of the corresponding inputs, relative to 4 devices connected to PFU 64 / FS board (GPR-GPR-1 ... 4) or the activation of the inputs corresponding to the 4 groups of devices connected to the board PFU 64 / EXP (GPR-GPR-1 ... 4).
The following examples respectively indicate the INC/DEC signals activation corresponding to devices 2 and 3 (PFU/64FS) and to Groups 2 and 3 (PFU/64EXP)
NOTE: LEDs of the board PFU/64EXP light in reverse mode with respect to the board PFU/64FS





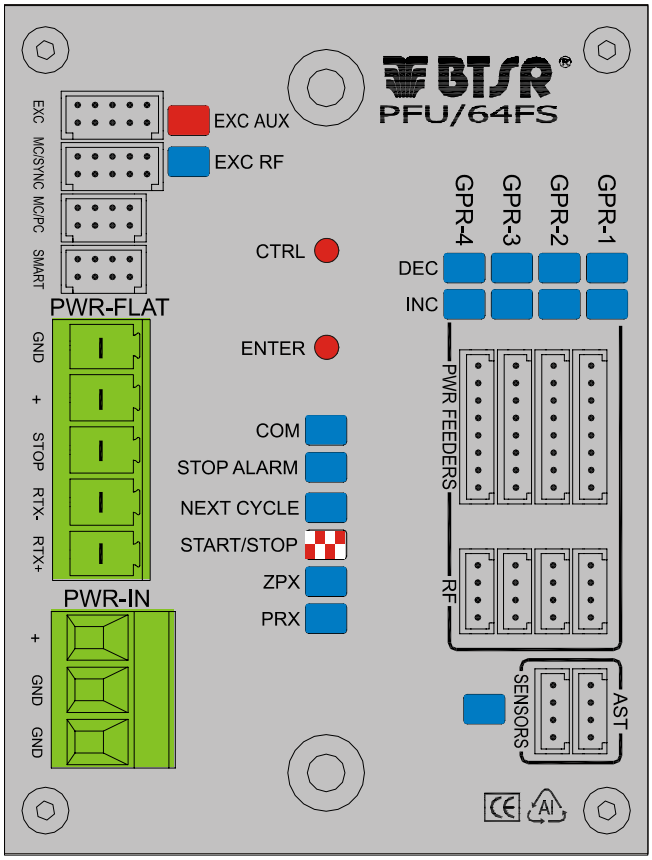
INC





DEC

The EXCLUSION signal activation is indicated by the EXC AUX LED lighting
In the Hardware 0/1 configurations, this operating mode is indicated by the START/STOP LED continuous blinking.



EXCLUSION signal active in Hardware 0 mode

SMART connector
This connector provides a serial line which can be used for the direct communication with all the Feeder devices connected by a BTSR programming terminal (SMART MATRIX PFU) or PC LINK software.

SMART RxTx+	Serial line reserved for SMART MATRIX PFU terminal connection (communication speed 345600 Bps)
SMART RxTx-	
AUX RxTx+	Serial line reserved for communication with PC LINK BTSR software (communication speed 115200 Bps)
AUX RxTx-	

MC/PC connector
In Hardware configuration this connector is currently not used.

EXC connector
This connector provides the I/O Hardware signals to control the Feeder devices connected to Groups 1-2-3-4.

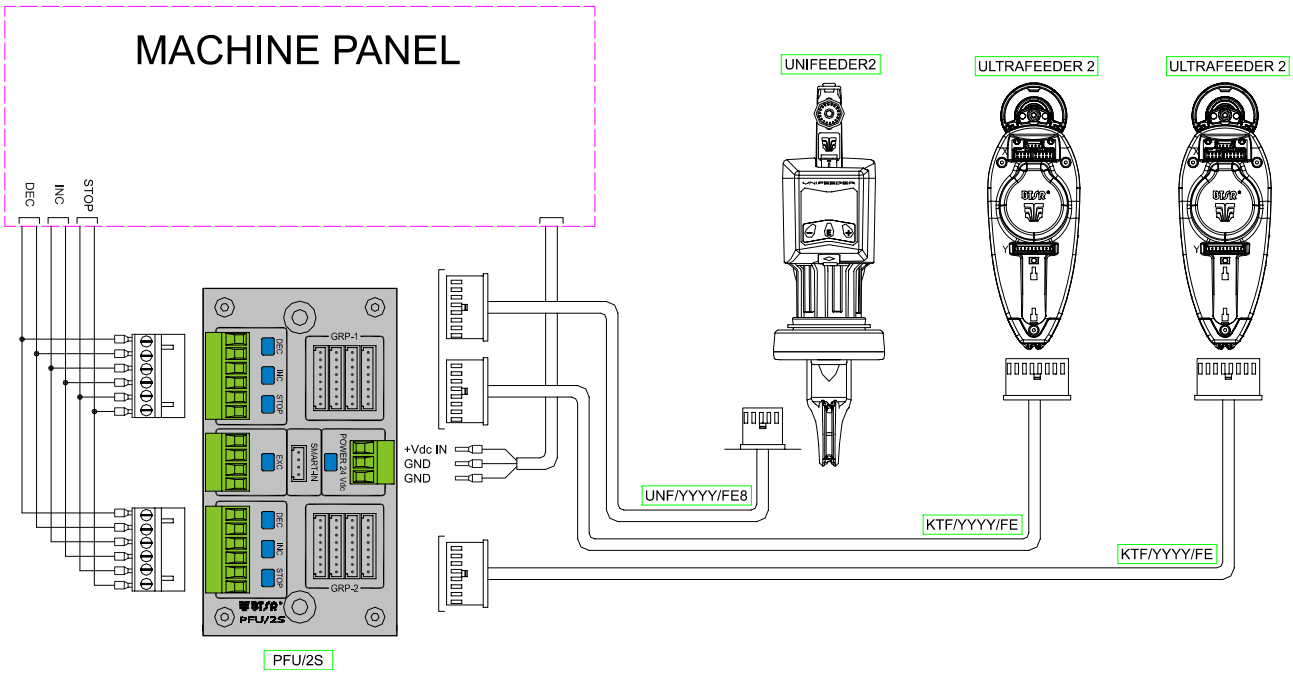
INC GRP 1	INC signals for Feeder devices connected to group GRP 1
DEC GRP 1	DEC signals for Feeder devices connected to group GRP 1
INC GRP 2	INC signals for Feeder devices connected to group GRP 2
DEC GRP 2	DEC signals for Feeder devices connected to group GRP 2
INC GRP 3	INC signals for Feeder devices connected to group GRP 3
DEC GRP 3	DEC signals for Feeder devices connected to group GRP 3
INC GRP 4	INC signals for Feeder devices connected to group GRP 4
DEC GRP4	DEC signals for Feeder devices connected to group GRP 4
EXC +	EXCLUSION SIGNAL OF ALL THE FEEDERS CONNECTED
EXC -	

MC/SYNC connector
This connector provides the auxiliary signals interfacing with the machine.

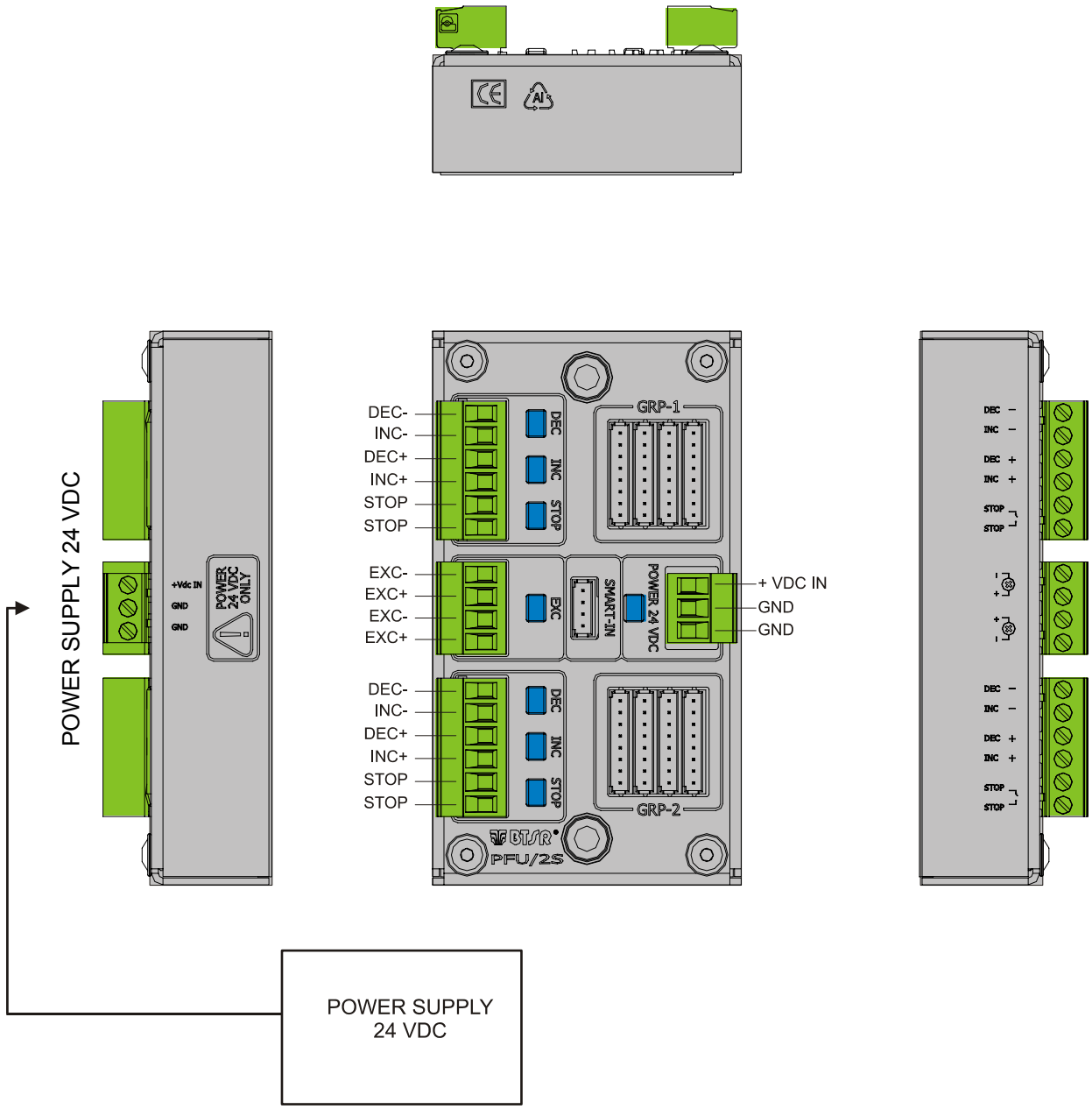
EX STOP 1	Alarm signal (to the machine stop input)
EX STOP 2	AUXILIARY STOP signal
EXC RF+	Positive OPTO-INSULATED signal for Rollingfeeder exclusion
EXC RF-	Negative OPTO-INSULATED signal for Rollingfeeder exclusion
INPUT POLARITY	Input lines PULL/UP and PULL/DOWN activation

Installation of ULTRAFEEDER 2 with PFU/2S power supplier

Connection Example of a Complete System including ULTRAFEEDER 2 Devices and PFU/2S Power Supplier



PFU/2S power supplier electrical interface



Installation of ULTRAFEEDER 2 with Flat Cable KTF/FLAT

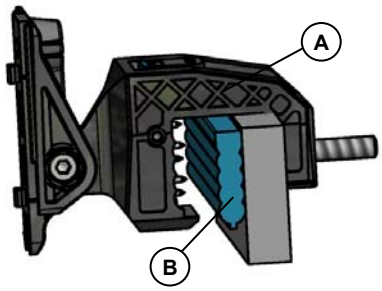
In this type of installation, the devices are powered by an external power supply, using a KTF/FLAT cable. *(This is the solution typically used for knitting machines)*
In this case the INC/DEC graduation can only be performed through a serial line.

The installation of ULTRAFEEDER 2 devices with flat cable KTF/FLAT is performed using KTF/FIX rapid clamping brackets “snap-on” on the backside of devices.

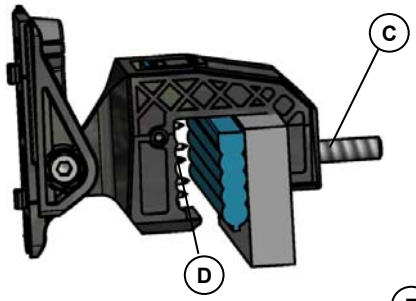
The KTF/FIX bracket is equipped with contact pins that penetrate the flat cable insulation layer and establish the electrical connection with the individual wires of flat cable, thanks to the pressure provided by a contrast screw.

The electrical connection between KTF/FIX clamping bracket and ULTRAFEEDER 2 device is provided by the KTF10/FIX cable.

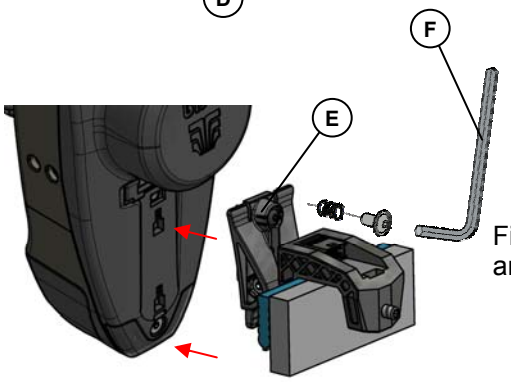
The following images show the installation procedure with ULTRAFEEDER 2 with flat cable KTF/FLAT.



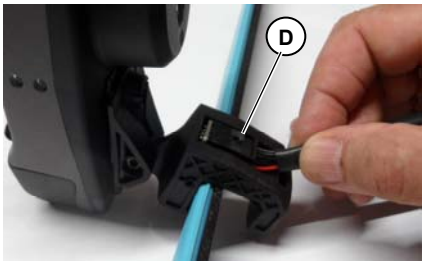
Placing of rapid clamping bracket KTF/FIX (A) on flat cable KTF/FLAT (B)



Tightening the contrast screw (C) to realize the electrical connection by "insulating perforation" through pins (D)



Fix the bracket "Snap-On" KTF/FIX on the backside of the device and screwing down (E) with an Allen 2, 5 mm (F)



Connect the KTF10/FIX cable (D) to the KTF/FIX connector

Connect the KTF10/FIX cable to the 8pin-connector of ULTRAFEEDER 2

☞ *In case of Master/Slave connection, the KTF10/FIX cable must be connected to the MA8/15/FE10/CAN cable male connector, which is connected in turn to the UNIFEEDER 2 device 10 pin-connector (without adapter cap)*
See picture on page 2.23.

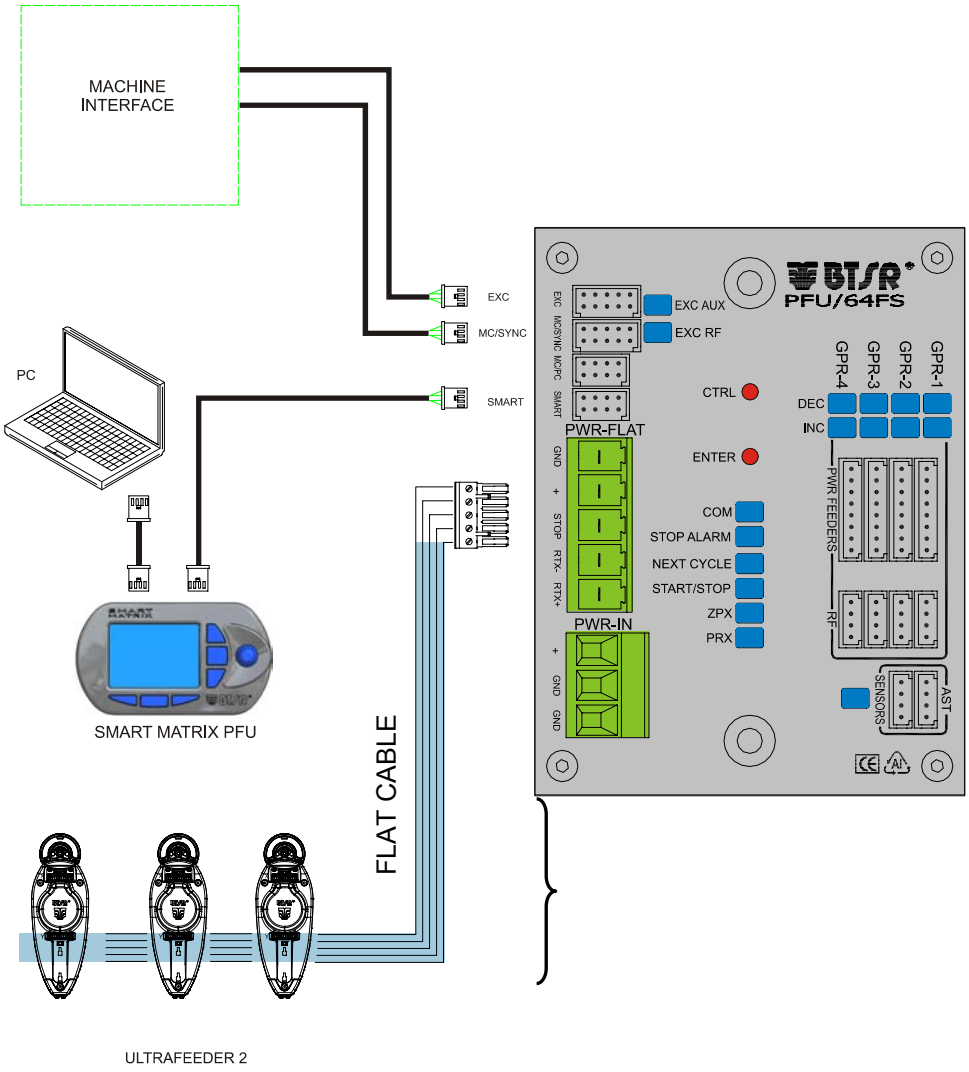
ULTRAFEEDER 2 correctly connected to the flat cable through KTF/FIX clamping bracket

☞ *The flat cable support bar must have a height of 25 mm.*

Connection cables and accessories in case of installation with flat cable KTF/FLAT

Flat cable KTF/FLAT for KTF/FIX	
KTF/FLAT	Variable length
Flat cable KTF/FLAT for KTF/FIX with connectors for BX4030RTP-X4 power supply module connection	
500/FLAT/PW4	Length 500 cm, with connector for KTF/PW4
Connection cable between ULTRAFEEDER 2 and KTF/FIX	
KTF10/FIX	Length 10 cm
Quick multi-connection clamping of ULTRAFEEDER 2 with flat cable KTF/FLAT	
KTF/FIX	Insulation pass-through rapid clamping bracket

Connection Example of a Complete System including ULTRAFEEDER 2 Devices, KTF/FLAT cable, SMART MATRIX PFU Terminal and PFU/64FS Power supplier

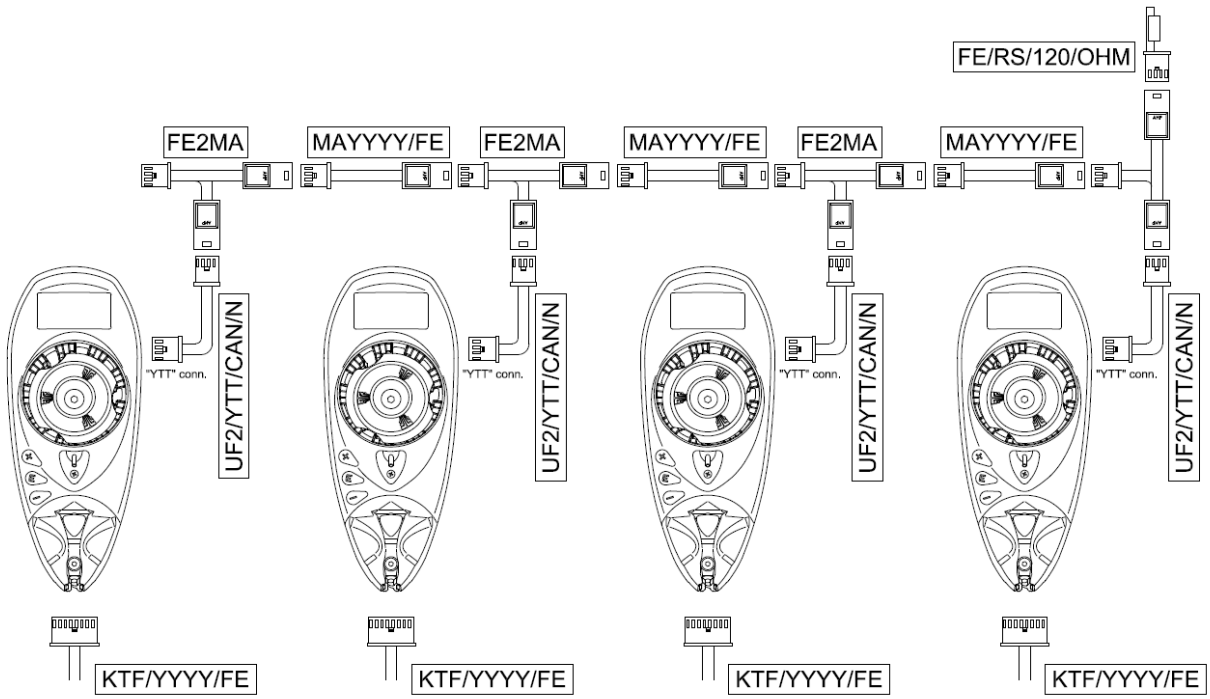


+ *For the Pin assignment on the machine interface connectors and the difference between the Hardware and Software operating modes, please refer to pages 2.10 to 2.17*

Installation of ULTRAFEEDER 2 in Master/Slave configuration

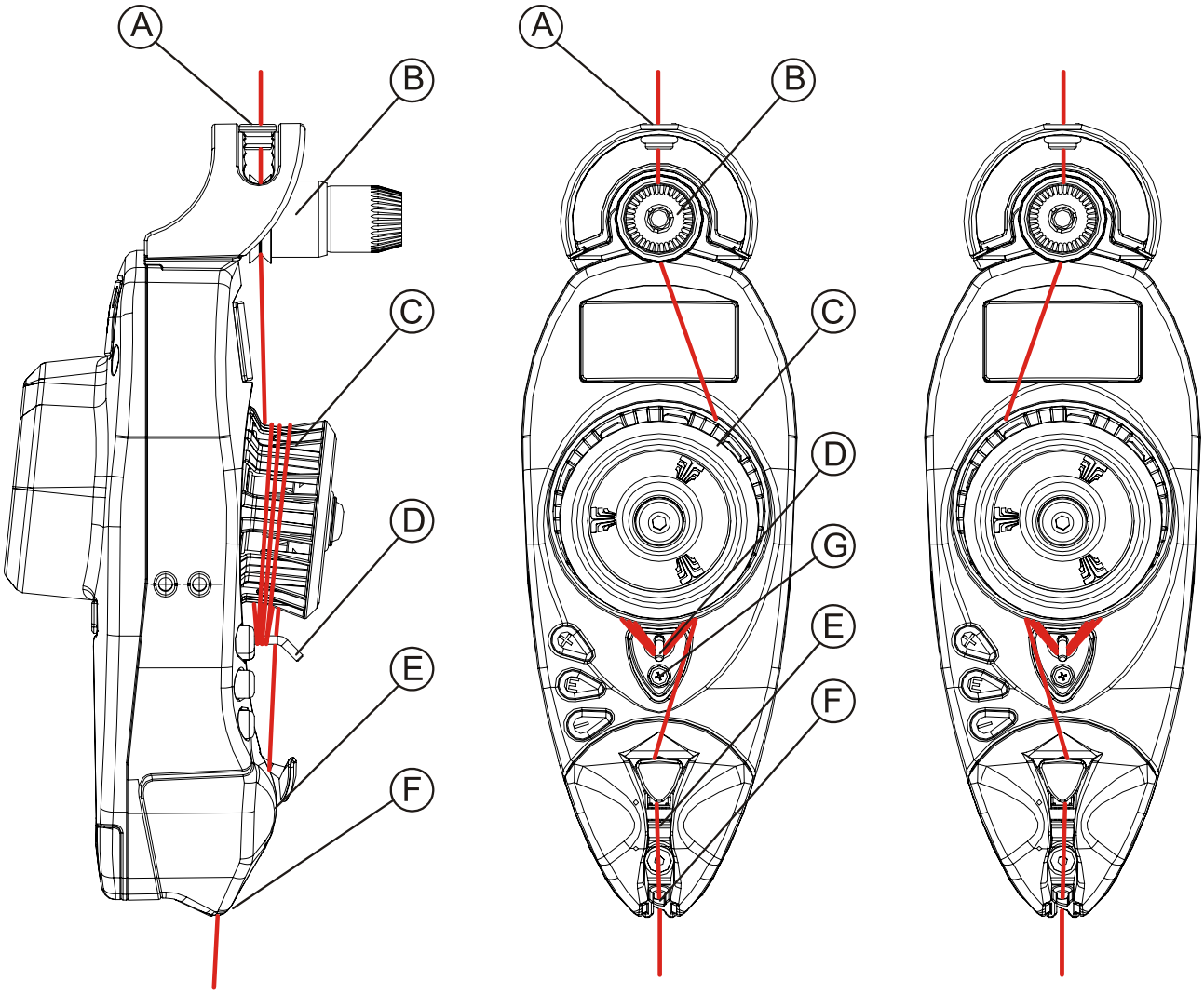
Using the Master/Slave operating mode, it is necessary to create the CAN bus communication among the various ULTRAFEEDER 2 devices.
To do this, remove the adapter caps from the ULTRAFEEDER 2 device connectors (please refer to ULTRAFEEDER 2 device electrical interface on page 2.2) and carry out the interconnection, as shown on the following figure .

ULTRAFEEDER 2 device interconnection by means of CAN bus for Master/Slave configuration



PFU/64FS (PWR UF/RF connector)
or
PFU/2S (connectors GROUP#1, GROUP#2)
or
KTF10/FIX (in case of FLAT CABLE connection)

Instructions for Correct Yarn Threading



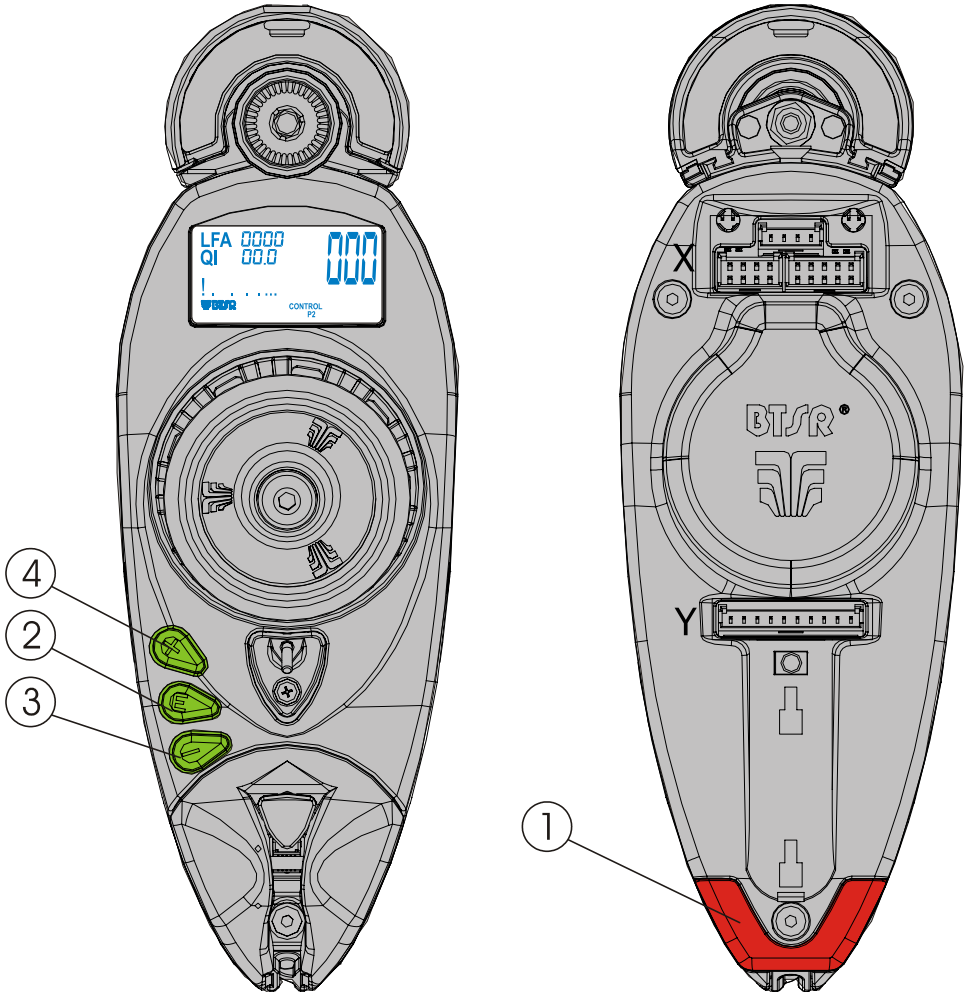
CW **CCW**

- Thread the yarn into the upper ceramic bush Ⓐ, lead it to the yarn finger Ⓑ and run 3 turns around the wheel Ⓒ, passing under the separation device Ⓓ, as shown on the figure.
- Then lead the yarn over the loading cell *(tension sensor)* Ⓔ, and pull it out of the lower ceramic bush Ⓕ, , as shown on the figure.
- For a correct separation of yarn coils on coil separation device Ⓓ, slightly tilt the separation device, while the device is running, using the adjustment screw Ⓖ.

3 – OPERATION

Operating Characteristics of ULTRAFEEDER 2 Devices

For programming and control of ULTRAFEEDER 2 devices, 3 keys, a signaling red LED and a LCD display are available to the operator.



1. RED LED (Read side)

Red Led on the rear side of device.
For the correct interpretation of the indications provided by the Leds, please refer to the table shown on page 4.1.

2. E KEY (ENTER)

Pressing and keeping pressed this key, the user can access to the simple devices programmable functions.
During programming, press it to confirm the displayed parameter.
In event of some parameters, Pressing and keeping pressed this key for about 3 sec, it is possible to enable/disable the related function.

3. - KEY (RESET)

Press this key to reset the alarms shown on ULTRAFEEDER 2 display *(red LED flashing).* During Programming, press it to decrease the value of shown parameter.
During the Control phase, without an alarm condition in progress, this key allows you to display the device's internal temperature.

4. + KEY (CONTROL)

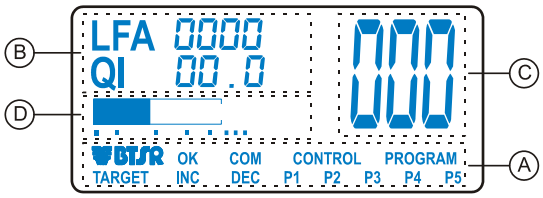
Press this key to temporarily disable the device *(lighting of rear LED and of ENTER, RESET, CONTROL key LEDs);* Press it again to re-enable the device. This key also allows de-activating *(OFF)* the power unit. During the programming, press it to increase the value of shown parameter.

> ⚠ Press this key whenever you need to operate on the device *(i.e. for yarn threading, coil separation device adjustment, etc.)* to avoid undesired start-up of the motor.

☞ *During the standard working, the three keys (ENTER, RESET and CONTROL) are lit green, except in event of Master/Slave option mode; in this case, infact, the LEDs are used to identify the linking between Master1/2 and the relevant Slaves. For further details, please refer to "Master/Slave mode" section (Page 3.19).*
In case of alarm or warning, the LEDs turn to red.

5. LCD DISPLAY

It allows showing in real time the working tension value and the set ones, the programmable parameters in the various menus, the error and warning messages, the device status, etc.



Symbols shown on LCD

A – Label Area

OK	Indicates the pressure of any of the 3 keys available on ULTRAFEEDER 2 device.
COM	Communication in progress with SMART MATRIX FEEDER/PFU terminal or with the PC.
CONTROL	Indicates that the ULTRAFEEDER 2 device is operating in Control status.
PROGRAM	Indicates that the ULTRAFEEDER 2 device is in Parameters Programming status.
TARGET	Indicates that the set Target has been reached.
INC	Indicates with 1 flashing the increment of main tension.
DEC	Indicates with 1 flashing the decrement of main tension.
P1	In Control environment indicates that the operating tension is the one defined in P1 *(MAIN TENSION).*
P2	In Control environment indicates that the operating tension is the one defined in P2 *(EXIT TENSION).*
P3	Indicates that the device is performing the automatic yarn relax.
P4	Indicates that the UNICO accessory connection has been detected.
P5	Not used.

B – Message Area

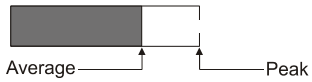
According to the selected language, it shows the various programming menu items, the error messages during the device operation, the quantity of yarn absorbed (LFA), the value of QI (QUALITY INDEX). **It is the reference value in event a device presents abnormalities during the yarn feeding. (*this value is given by the average of the deviation in positive and negative of the yarn tension. with respect to the set tension value and is expressed with a resolution of 0.1 g*)**, the device internal temperature, etc.

C – Value Visualization Area

It shows the yarn tension value during the normal operation of the device, or the parameter being programmed.

D – Graphic Visualization Area

It shows, in graphical form *(through a logarithmic scale)* both average and peak tension values.



Functions Available to the Textile Machine Operator

The operator of a textile machine equipped with ULTRAFEEDER 2 devices has the possibility to perform some simple manual operations on the device, without having to request the aid of a supervisor or production manager:

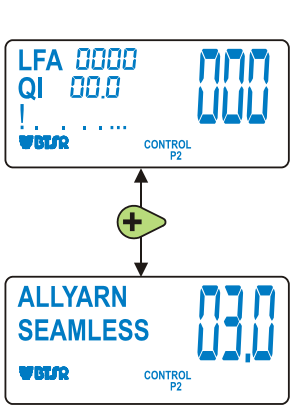
1) Alarm reset
2) Current yarn type and application reading
3) Disable or enable a ULTRAFEEDER 2 device.
4) Real-time control of device temperature and current absorbed by the device's motor.
5) Checking and setting of the yarn tension value and QI (quality Index) reading

1) Alarm Reset

When a ULTRAFEEDER 2 device detects an Error condition (E2, Tension Error, etc.), the device stops and the LFA nnnn indication on display is replaced by the error message.
To reset the alarm, once you have removed the cause that generated the error, press the ⊖ *key on the device.*

2) Current Yarn Type and Application Reading

At any time, pressing the ⊕ *key, you may check the yarn type and the application currently configured on the device.*



Press ⊕:

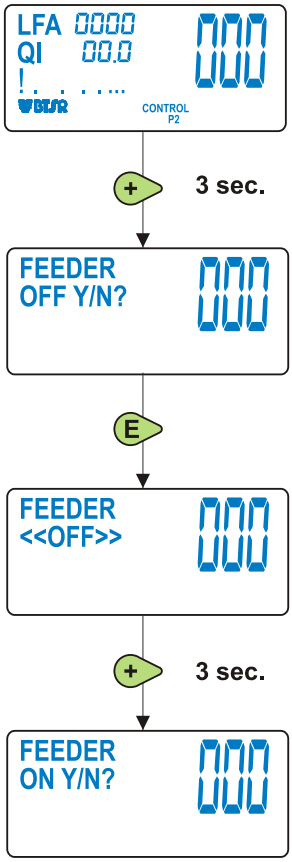
The display will show the yarn type *(ELASTIC, ELASTIC2, ELASTIC3, ALL YARN, ALL YARN2, ALL YARN3)* and the application currently configured on the device *(SOCKS, REVERSE SOCKS, MEDICAL SOCKS, PANTYHOSE, SEAMLESS, KNIT, REVERSE KNIT, FLAT KNIT)*.

The front/rear red LEDs as well as the red LEDs of keys ⊕, E, ⊖ turn to red.

Press ⊕ key to return to LFA menu.

3) ON / OFF of ULTRAFEEDER 2 Device

When needed, it is possible to DEACTIVATE an ULTRAFEEDER 2 device. To DEACTIVATE and/or REACTIVATE a device, operate as follows:



DEACTIVATE:

Press and KEEP PRESSED for 3 seconds (+):

The display will show the DEACTIVATION confirmation request.

(E) to confirm the DEACTIVATION·

(−) to cancel the OPERATION·

The <<OFF>> indication shown on display indicates that the device is currently DEACTIVATED.

REACTIVATE:

To re-activate the device press and hold down for 3 seconds (+).

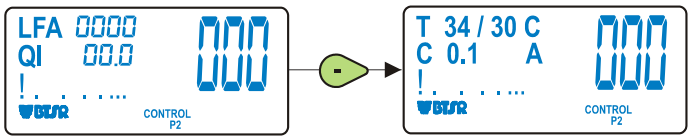
(E) to confirm the REACTIVATION·

(−) to cancel the operation·

☞ *In order to temporarily de-activate an ULTRAFEEDER 2 device, simply press (+). The condition of device temporarily de-activated is signaled by the lighting of the two red LEDs on the device, by the lighting of the red LEDs on the three device's keys and by the lighting of the Stop Led on the power supplier.*

4) Control of Temperature and Current Absorbed by ULTRAFEEDER 2

At any time, pressing and keeping pressed the (−), key, you can check the internal temperature (T) of the control board (34°C in the example below) and of the motor (30°C in the example below), as well as the current absorbed by the motor (C) in Ampere (0.1 A in the example below).



Programming the ULTRAFEEDER 2 Devices

The ULTRAFEEDER 2 device offers two programming environments:

1) **SIMPLE** *(allows programming exclusively the device main tension)*
2) **ADVANCED** *(allows programming all the device parameters)*

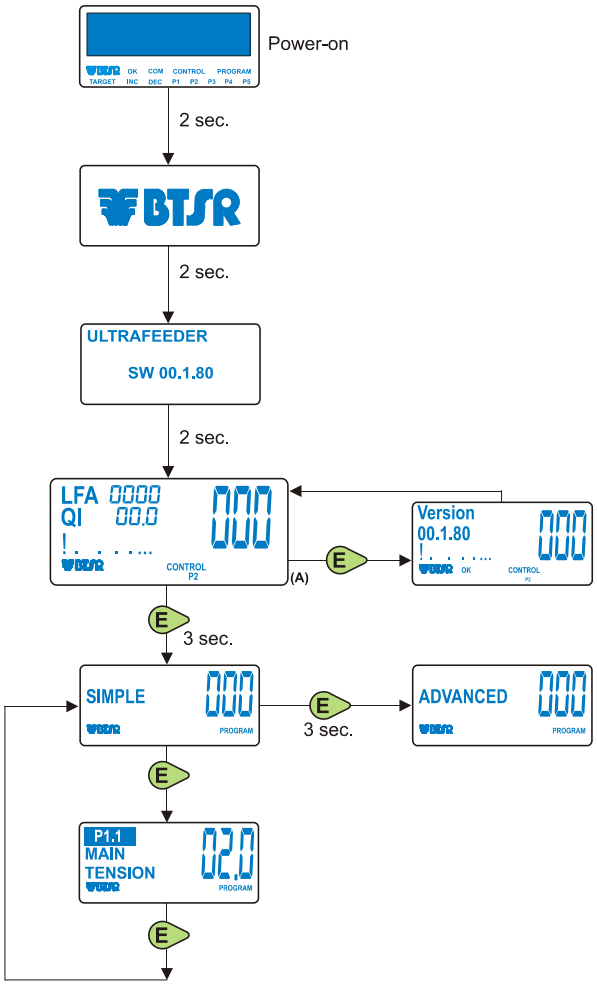
To have access to the programming environment, press and keep pressed for 3 seconds the ENTER key, while the device is operating in Control environment.

If you keep the key pressed for less than 3 seconds, the device Firmware version will temporarily appear on the display.

To switch from **SIMPLE** to **ADVANCED** and viceversa, press and keep pressed for 3 seconds the ENTER key.

☞ *To avoid undesired changes of operating parameters, after the installation of ULTRAFEEDER 2 devices and after having setup and checked all the working parameters in **ADVANCED** programming environment, it is advisable to activate the **SIMPLE** programming environment, so that when the operator will subsequently enter the programming environment, he/she will only have the possibility to change the main tension (1st variable of P1).*

General Diagram of Simple Programming Environment



(A) *LFA = Length of Absorbed Yarn in m/min*
QI = Quality Index

Advanced Programming of ULTRAFEEDER 2 Devices

The **ADVANCED** environment, allows programming each ULTRAFEEDER 2 device, with specific parameters that depend on the type of yarn, on the type of application and on the product requirements.

- **MAIN TENSION** Working Tension
- **ERROR TENSION** Tolerance beyond which an Error is generated
- **TIME ALARM** Time for which the tension may stay out of tolerance
- **INC-DEC TENSION** Δ Tension for INC/DEC graduation
- **EXIT TENSION** Device Tension with machine not running
- **RELAX YARN** It corresponds to the number of revolutions carried out at constant speed during the yarn relax stage
- **RELAX SPEED** Yarn feeding speed during the RELAX YARN stage

Additionally it is possible to program specific functions using parameters that act on the device operating mode:

- **APPLICATION** Device operating mode, pre-defined according to the application. The following pre-defined applications are available: SOCKS, REVERSE SOCKS, MEDICAL SOCKS, PANTYHOSE, SEAMLESS, KNIT, REVERSE KNIT, FLAT KNIT.
- **YARN TYPE** Possibility of presetting the device for management of elastic yarns.
- **OFFSET** Possibility of reading the OFFSET value of the tension sensor and running the device Auto Offset procedure of the load cell.
- **ACCESS CODE** Possibility of setting a protection password to prevent undesired access to the device programmable functions.
- **U-FEEDER CODE** Possibility of visualizing and/or setting the device identification code.
- **LANGUAGE** Possibility of setting the desired language.
- **SIGNAL POLARITY** Possibility of choosing the polarity of INC-DEC and STOP signals *(either NO or NC)*.
- **OPERATING MODE** Device operating mode (*MASTER 1, MASTER 2, SLAVE 1, SLAVE 2*)
- **MOTOR ROTATION** Possibility of setting the motor rotation direction

The setting of these parameters is already done by BTSR during manufacturing *(default values)* but the user according to his needs, using the advanced programming features, can easily change it.

ULTRAFEEDER 2 devices offer 4 advanced programming MENU: **P1, P2, P3** and **P4**, clearly indicated in the messages area of LCD during the programming.

Menu P1. Allows programming the following parameters:

- MAIN TENSION
- ERROR TENSION
- TIME ALARM
- INC-DEC TENSION

Menu P2. Allows programming the following parameters:

- EXIT TENSION
- RELAX YARN
- RELAX SPEED

Menu P3. Allows programming the following parameters:

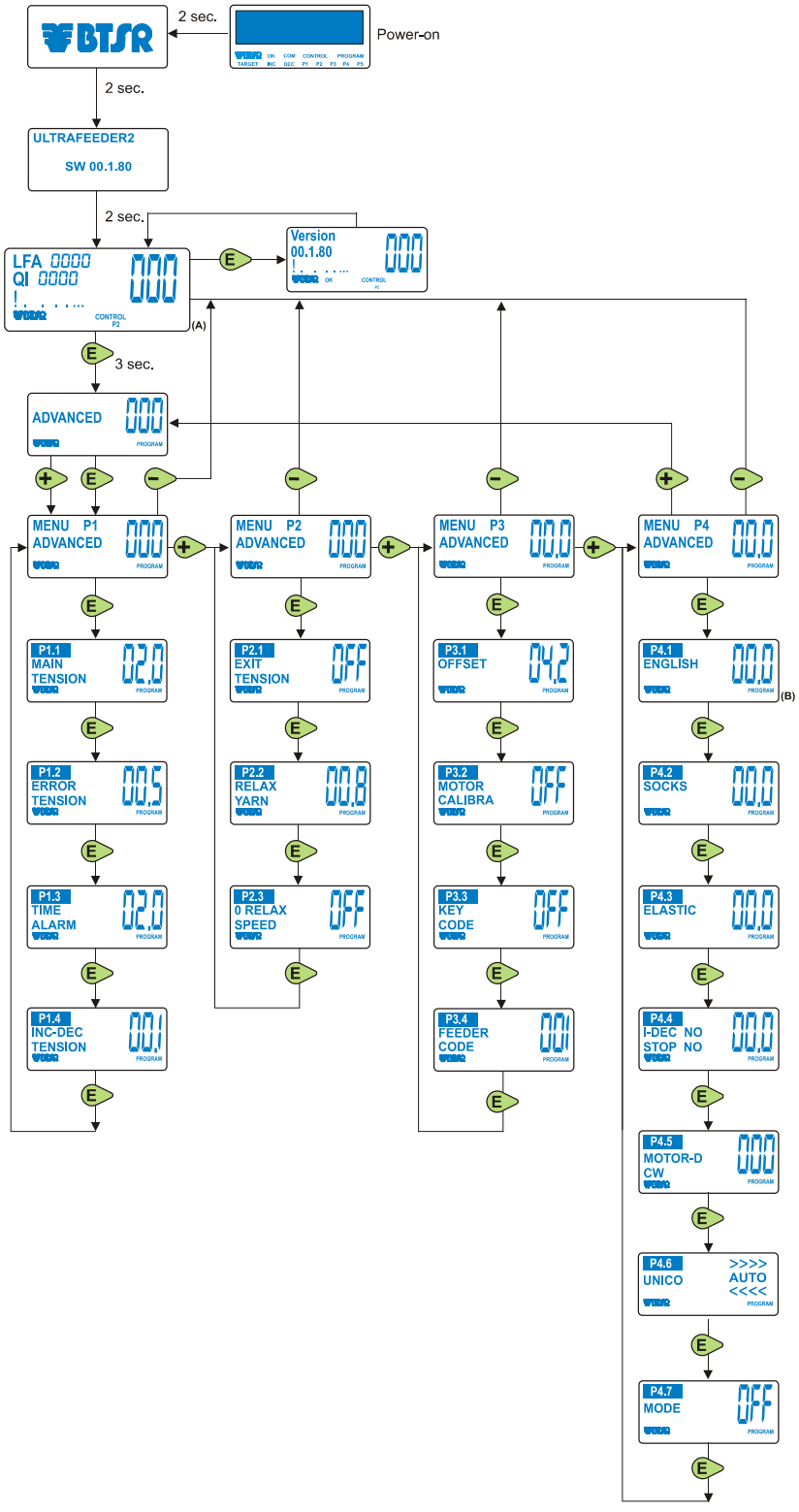
- OFFSET
- MOTOR CALIBRA
- ACCESS CODE
- U-FEEDER IDENTIFICATION CODE

Menu P4. Allows programming the following parameters:

- LANGUAGE SELECTION
- APPLICATION
- YARN TYPE
- INC-DEC and STOP POLARITY
- MOTOR ROTATION
- UNICO
- OPERATING MODE

Press the + *(Control)* key to switch from one programming level to the next one.
Press − *(Reset)* key to quit the programming environment.

General Diagram of P1÷P4 Advanced Programming Levels and Default Settings



NOTES: *The values shown refer to the default parameters (set by BTSR).*

(A) *LFA = Length of Absorbed Yarn in m/min*
QI = Quality Index

(B) *The available languages are Italian, English, French, Spanish, German, Japanese, Chinese.*

P1 MENU Programming Level

LFA m/min ➔ **ADVANCED** ➔ **MENU P1**

The P1 MENU programming level allows you to setup 4 parameters:

1) Device main tension; (MAIN TENSION)
2) Tolerance percentage with respect to the main tension; (ERROR TENSION)
3) Max deviation time from tolerance band; (TIME ALARM)
4) Increment/Decrement resolution of graduated tension (INC/DEC TENSION).

With the ULTRAFEEDER 2 in CONTROL status, *(LFA and QI displayed on LCD)* press E and hold it down for 3 seconds.
The display will show the **ADVANCED** label and the ULTRAFEEDER 2 will switch to PROGRAM status.
E or + to continue.

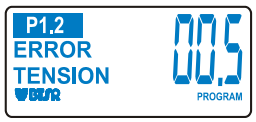
E to start programming of parameters belonging to P1 menu.

P1.1 **MAIN TENSION**

Tension value to whom the device must feed the yarn *(INC/DEC controls active)*.
[Allowed values 00.2 ÷ 99.5 grams].

Choose the desired value using:
+ *(to increase the value)* or − *(to decrease the value).*
E to confirm.

P1.2 **ERROR TENSION**

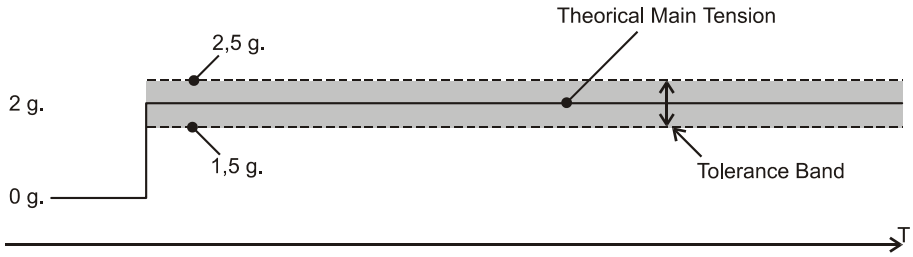


Tolerance band beyond which the machine will be stopped. The error indication and machine stop occur only if such tolerance is exceeded for the time period set in the next parameter *(TIME ALARM)*.
[Allowed values ± 00.0 (*) ÷ 99.9 grams]. The set value indicates the tolerance, in grams, with respect to the set tension value.

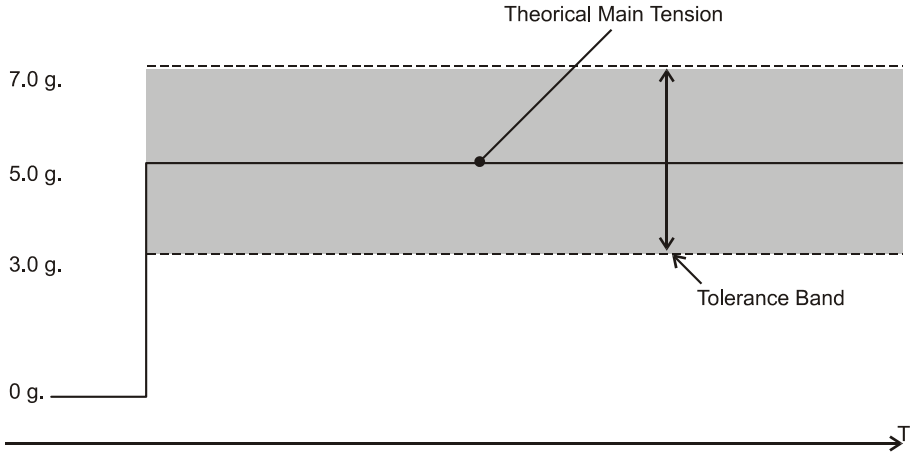
(*) *Setting 00.0 activates the AUTO mode; this means that the system will automatically calculate the error threshold as 50% of MAIN TENSION. This means that when changing the MAIN TENSION. (P1.1) value, the ERROR TENSION value changes accordingly, without the need of changing it manually.*

Set the desired value using the keys:
+ *(to increase the value)* or − *(to decrease the value).*
E to confirm.

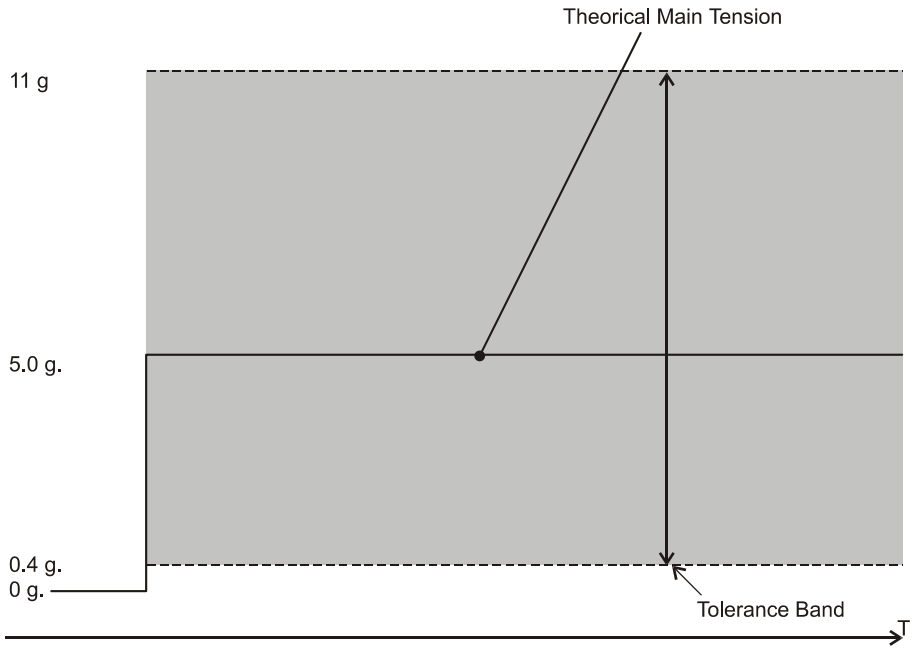
Example 1: Main Tension: 2.0 g
Error Tension: ± 0.5 g



Example 2: Main Tension: 5.0 g
Error Tension: ± 2.0 g



Example 3: Main Tension: 5.0 g
Error Tension: ± 6 g



P1.3 **TIME ALARM**

Time during which the tension value may stay out from the tolerance range set in the previous parameter *(ERROR TENSION)*. You can disable *(OFF)* keeping pressed the Enter key for 3 seconds.
[Allowed values 00.0 (*) ÷ 25.0 seconds].

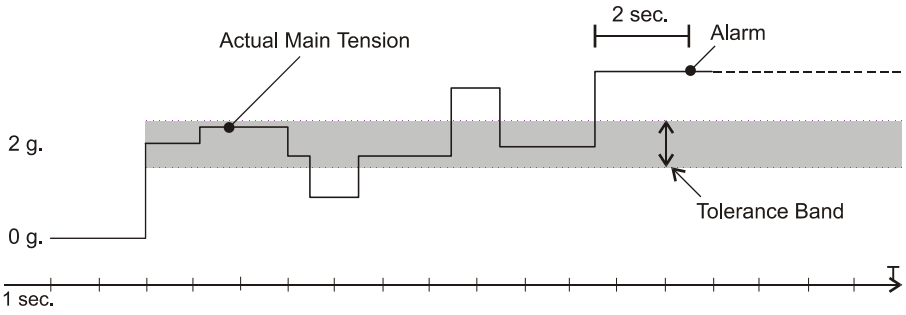
(*) *Setting 00.0 activates the AUTO mode; this means that the system automatically calculates the optimum time alarm generation and machine stop time, depending on the feeding speed. At low speed, the time is 500 ms; as the speed increases this time will be reduced up to a minimum of 50 ms; this allows a quick machine stop during normal working, avoiding, however, the risk of false stops when the machine is working at low speed.*

Set the desired value using the keys:

(+) *(to increase the value)* or (−) *(to decrease the value).*

(E) to confirm.

Example: Main Tension: 2.0 g
Error Tension: ± 0.5 g
Time Alarm: 2.0 sec.



P1.4 **INC-DEC TENSION**

Increment/decrement resolution of the tension graduated by INC/DEC external pulses *(At every INC/DEC pulse, the main tension will be either increased or decreased by the amount indicated by this parameter with respect to the value set in MAIN TENSION (1st variable of P1)).*

Keeping the (E) key pressed, you can disable the function

[Allowed values 00.1 ÷ 10.0 grams].

(E) to return to the beginning of P1 menu.

(+) to switch to P2 menu.

(−) to return to CONTROL status without programming P2, P3 and P4 menus.

P2 MENU Programming Level

LFA m/min ➔ **ADVANCED** ➔ **MENU P2**

The P2 MENU programming level allows you to setup 3 parameters:
1) Device tension with machine stationary;
2) Amount of yarn fed during the stop phase (relax);
3) Yarn feeding speed at which the relaxation function shall be activated.

⊕ to select the P2 level.

E to continue with programming of P2 menu parameters.

P2.1 EXIT TENSION

Tension value of device when the machine is not running or out of working zone *(INC/DEC pulses deactivated).* By setting a value higher or lower than the value set with MAIN TENSION parameter of P1 menu, you can control the deceleration phase of ULTRAFEEDER 2 device.
This function may be either enabled *(with values ranging from 00.2 ÷ 99.5 grams)* or disabled *(OFF)*. To disable the function press and hold down for 3 seconds the Enter key.
The **OFF** indication means that the function has been disabled. In this case the EXIT TENSION parameter will assume the same value set on MAIN TENSION parameter within the P1 programming level.
To re-enable this function press and hold down for 3 seconds the Enter key. The **OFF** indication will disappear and it will be replaced by a modifiable numeric value. Set the desired value using the keys:
⊕ *(to increase the value)* or ⊖ *(to decrease the value).*
E to confirm.

P2.2 RELAX YARN

The RELAX YARN parameter has different meanings according to the setting of parameter 2.3.

P2.3 = 0 (OFF):

The parameter 2.2 is not significant

P2.3 = S (Standard)

The parameter 2.2 indicates the amount of yarn fed during the stop phase. This function allows relaxing the yarn, each time the ULTRAFEEDER 2 device stops running.

The value set with this parameter corresponds to the number of revolutions carried out by the wheel *(motor)* when reaching the speed value indicated by next parameter *(RELAX SPEED)*, prior to stop.

[Allowed values 00.2 ÷ 95.5 revs].

(Example: during the processing phase of wrist band elastic or socks strap, this function allows performing a yarn tension relaxation at the end of the processing

phase itself, thus permitting an easy clipping operation).

Example of programmed tensions:
MAIN TENSION (P1) = 2 grams
EXIT TENSION (P2) = 4 grams
RELAX YARN (P2) = 0.8 revs of the wheel at the speed defined in P2.3

Choose the desired value using:

(+) *(to increase the value)* or (−) *(to decrease the value).*

(E) to confirm.

P2.3 = A (Advanced):

The parameter 2.2 indicates the tension, the ULTRAFEEDER 2 shall operate with when the motor speed is lower than the speed indicated on parameter 2.3.
[Allowed values 00.2 ÷ 95.5 gr].

MAIN TENSION (P1) = 2 grams
RELAX YARN (P2) = 0.8 gr when the device speed is < the speed defined on P2.3

Choose the desired value using:

(+) *(to increase the value)* or (−) *(to decrease the value).*

(E) to confirm.

P2.3 **RELAX SPEED**

Yarn feeding speed used to activate the RELAX YARN function. When the yarn feeding speed becomes lower than the value set with this parameter, the RELAX TENSION function will be automatically activated.

3 different settings for the parameter 2.3 are available. Keep the (E) key pressed for 3 seconds to switch from a setting to the other.

P2.3 = 0 (OFF):

Function disabled

P2.3 = S (Standard):

[Allowed values 000 ÷ 010] where:

000 means activation speed < 1 mt/min
001 means activation speed 1 mt/min.
002 means activation speed 5 mt/min.
003 means activation speed 10 mt/min.
004 means activation speed 15 mt/min.
.
.
009 means activation speed 45 mt/min.
010 means activation speed 50 mt/min.

P2.3 = A (Advanced):

[Allowed values 000 ÷ 850]; in this mode the parameter indicates the speed in m/min.

Choose the desired value using:

(+) *(to increase the value)* or (−) *(to decrease the value).*

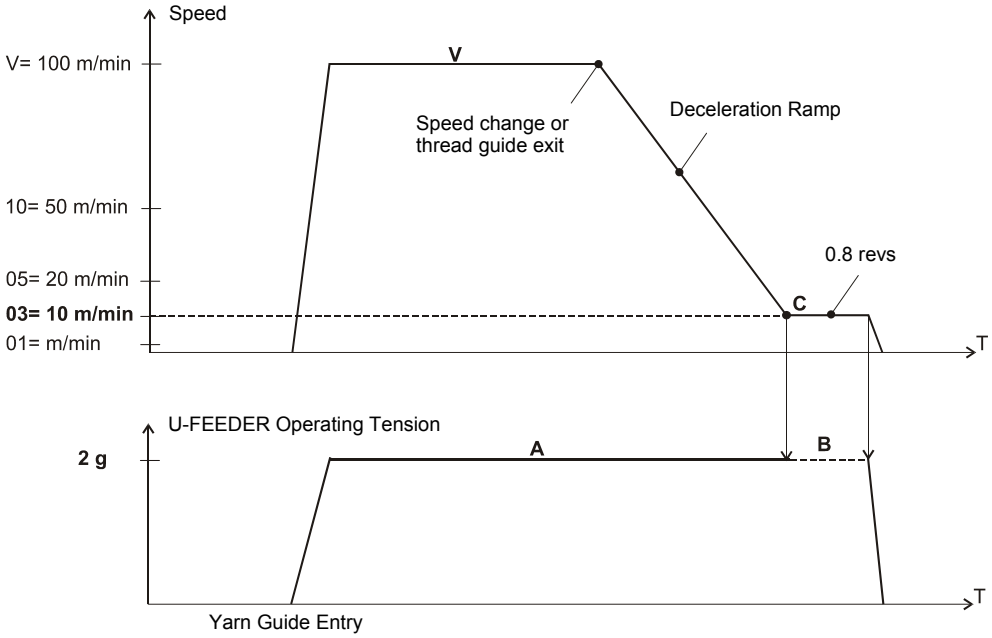
(E) to return to the beginning of P2 menu.

(+) to switch to P3 menu.

(−) to return to CONTROL status without programming P3 and P4 menus.

Example of Relax Yarn and Relax Speed Parameters Interaction

(V) = Nominal Yarn Feeding Speed = 100 m/ min
(A) = Main Tension (P1.1) = 2.0 g
(B) = Relax Yarn (P2.2) = 0.8 revs of the wheel at the speed defined in P2.3
(C) = Relax Speed (P2.3) = 03 (10 m/min) (Standard setting)

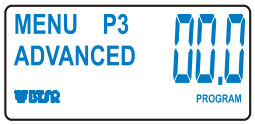


During the operation with nominal yarn feeding speed (V = 100 m/min), the ULTRAFEEDER 2 device operates with the tension set in MAIN TENSION (A), after a speed change and/or a thread guide exit condition, the feeding speed decreases following a deceleration ramp and, when it reaches the value programmed in RELAX SPEED (03 = 10 m/min in the example above) the device will carry out a wheel rotation by the number of revolutions set on P2.2, then it will stop.

P3 MENU Programming Level

LFA m/min ➔ **ADVANCED** ➔ **MENU P3**

The P3 MENU programming level allows you to setup 4 parameters:
1) Offset reading/execution and Auto Offset enabling;
2) Device operation mode;
3) Access code to programmable function;
4) ULTRAFEEDER 2 identification code.



(+) to select the P3 level.

(E) to continue.

P3.1 **OFFSET**

The Offset value indicates the calibration value of the load cell of the tension sensor of the device. The value, appearing on the display, is the current OFFSET value with the yarn placed onto the sensor load cell. The automatic OFFSET procedure, cancels any measurement errors also due to different placements of the device on the machine.

While lifting the yarn above the load cell, press (+) to check whether the **stored OFFSET** value corresponds to the base **OFFSET** value (*5 g*). If the two values are different, press briefly (−) to align them.

Auto-Calibration of the Loading Cell

Keeping pressed (−) for 3 seconds, is activated the load cell Auto-Calibration procedure which brings back the Offset value to 2.5 grams *(factory calibration value of ULTRAFEEDER 2 devices)*. (in case of use of *via BTSR PROGRAMMING TERMINAL*, it's possible to launch the procedure directly from the terminal)

During the auto-calibration process, an "OFFSET INT-CALI" message is temporarily shown on the display.

(E) to pass to the next parameter.

P3.2 MOTOR CALIBRATION

Automatic function reserved to BTSR service staff, in case of motor replacement.

It allows executing the automatic calibration of the new motor.

To activate the motor calibration procedure, press and hold down E for 3 seconds.

The OFF indication will be replaced by 000 and the motor will automatically carry out a number of movements to both directions, in order to adjust the calibration, then it will stop and the OFF will re-appear.

E to select the next parameter.

P3.3 KEY CODE

This function allows you to define a secret numeric code to prevent non authorized personnel from accessing the P1, P2, P3, P4 programmable functions.

This function may be either enabled or disabled by holding down the E key for 3 seconds.

OFF indicates that the function is currently disabled.

If you enter an access code, this will be requested each time you attempt to activate the programming environment.

When the CODE ??? request appears, type the secret key-code using + and − keys.

\+ increase the value of secret key code.

− decreases the value of secret key code.

Press E to save the key-code and move to the next parameter.

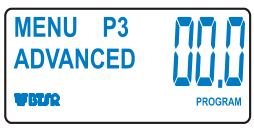
P3.4 FEEDER CODE

It allows you to view and / or set the numerical code that identifies the device.

Set the desired identification code using + *(to increase the value)* or − *(to decrease the value).*

☞ *Usually, the device identification code setting is done via BTSR programming terminal or via machine board. In certain circumstances (for example, after replacing a device ULTRAFEEDER 2), it can be useful do this setting directly from the new device.*

E to return to the beginning of P3 menu.



\+ to switch to P4 menu.

− to return to CONTROL status without programming P4 menu.

P4 MENU Programming Level

LFA m/min ➔ **ADVANCED** ➔ **MENU P4**

The P4 MENU programming level allows you to select the following parameters:

1) *Language used to display menus and messages;*
2) *Application on which the device will be used;*
3) *Yarn type: either normal or elastic;*
4) *INC-DEC and STOP signal polarity (Normally Open or Normally Closed contact).*
5) *Operating Mode*

(+) to select the P4 level.

(E) to continue.

P4.1 LANGUAGE SELECTION

This function allows you to select the language used to display parameters and error messages.

(+) or (–) to scroll forward/backward the list of available languages:

ITALIANO – ENGLISH – FRANCAIS – ESPANOL – DEUTSCH – JAPANESE - CHINESE

(E) to confirm the option and pass to the next parameter.

P4.2 APPLICATION SELECTION

This function allows you to select one of the pre-defined applications.

The behavior of ULTRAFEEDER 2 device *(e.g. reaction to INC/DEC pulses)* will depend on the chosen application.

(+) or (–) to scroll forward/backward the list of available applications:

SOCKS – REVERSE SOCKS – MEDICAL SOCKS – PANTYHOSE – SEAMLESS – KNIT – REVERSE KNIT – FLAT KNIT

(E) to confirm the option and pass to the next parameter.

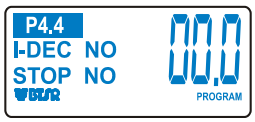
P4.3 CONTROL ALGORITHM

This function allows setting the device's reactivity to keeping and controlling the working yarn tension. The algorithm depends on yarn's features and on the type of product being produced.

(+) or (−) to choose between ELASTIC * ELASTIC2, ELASTIC3, ALL YARN, ALL YARN2 or ALL YARN3 options.

(E) to confirm the application shown on display and move to the next parameter.

* The ELASTIC mode allows a better handling of bare elastic yarns.



P4.4 SIGNAL POLARITY

This function allows setting the polarity of INC-DEC and STOP signals.

(+) to toggle the INC-DEC signal between NO or NC.

(−) to toggle the STOP signal between NO or NC.

(E) to confirm the options shown on display and move to the next parameter.

P4.5 MOTOR-D

This function allows you to select the ULTRAFEEDER 2 device motor rotation direction.

(E) for 3 seconds to switch from CW (clockwise) to CCW (counterclockwise) or vice-versa

(E) to confirm the options shown on display and move to the next parameter.

P4.6 UNICO

This function allows you to either enable or disable the functionality of UNICO accessory.

(+) or (−) to select either AUTO (function enabled) or OFF (function disabled).

(E) to confirm the options shown on display and move to the next parameter.

P4.7 **OPERATING MODE**

This function allows you to choose the operating mode of ULTRAFEEDER 2 devices.

(+) or (-) to scroll up or down the list of available modes:

OFF – MASTER 1 – MASTER 2 – SLAVE 1 – SLAVE 2

(OFF= Master/Slave mode deactivated)

E to confirm the option shown on display and return to P4 menu.

☞ *The MASTER/SLAVE mode details are described on the following page.*

MASTER/SLAVE mode

To achieve a high quality product on multi systems knitting machines, it is necessary that:

- the yarn tension is homogeneous
- the yarn feeding speed is constant and perfectly equal for all devices.

This can be achieved operating in Master / Slave mode where more SLAVE devices follow the speed of the Master using the communication line CAN bus, in order to obtain homogeneous and constant feeding speed for all the devices.

Example:
Assuming that the MASTER and the SLAVE devices are working with a tension set to 4 g and that the detected speed of the MASTER is of 200 m / min. while the detected speed of a Slave is of 190 m / min, the SLAVE device will decrease its working tension in order to reach a speed equal to the "MASTER" one.

On the same machine, could be installed groups of devices that work in a different way.
It's possible to define more Master devices and Slave groups: Slaves 1 follow the Master 1 information; Slaves 2 follow the Master 2 information, etc.
Actually it's possible to define a maximum of two Master (Master 1 and Master 2); to each Master can be assigned an unlimited number of Slave.

The Master / Slave mode can be used both in applications that use exclusively Unifeeder devices and in applications that use different types of devices, as shown in the following table.

MASTER	SLAVE	APPLICATION
ULTRAFEEDER 2	ULTRAFEEDER 2	Various
ULTRAFEEDER 2	ROLLING FEEDER	Small, medium, large diameter circular machines
ULTRAFEEDER 2	ROLLING MED	Machines for medical socks

During the normal operation, to easily locate the association between each Master and the relevant Slaves, a different LED lighting code is used:

- The LED + lights-up on Master 1 and relevant Slaves 1
- The LEDs + and E light-up on Master 2 and relevant Slaves 2

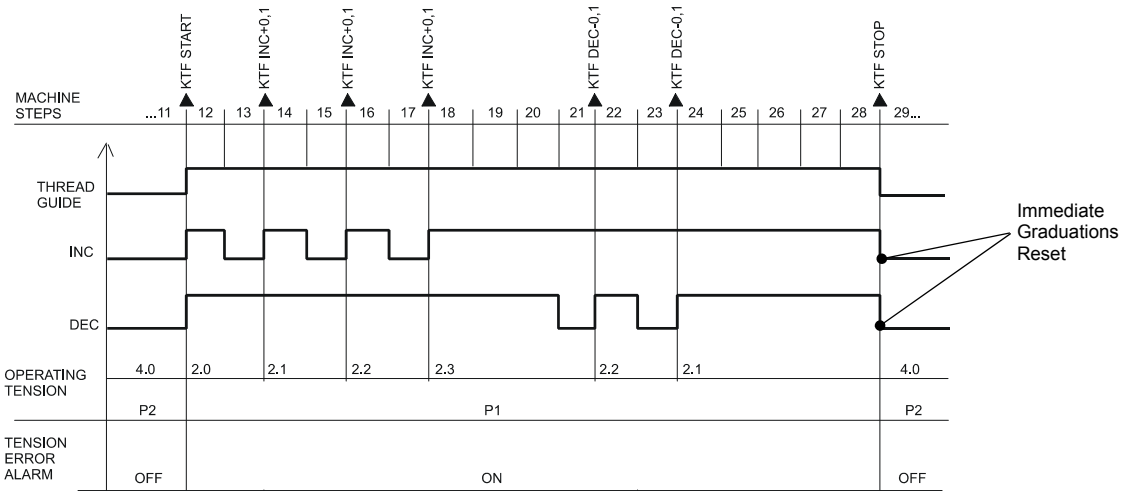
If a Slave does not receive data, for instance due to communication problems on CAN bus, then the red signalling will blink (*LED + in case of Slave 1, LEDs + and E. in case of Slave 2*)

INC/DEC Programmable Commands

Using the INC-DEC commands it is possible to either increment or decrement the tension set in P1 *(MAIN TENSION)*.
The reset of INC/DEC graduation, as well as the management of “Error Tension” Alarm depend on the selected working mode.

Applications: SOCKS,REVERSE SOCKS, PANTYHOSE, SEAMLESS, KNIT, FLAT KNIT, REVERSE KNIT

- Immediate graduation reset, as soon as the INC/DEC signals are simultaneously de-activated;
- “Error Tension” Alarm active only when ULTRAFEEDER 2 operates with P1 Tension *(MAIN TENSION)*.

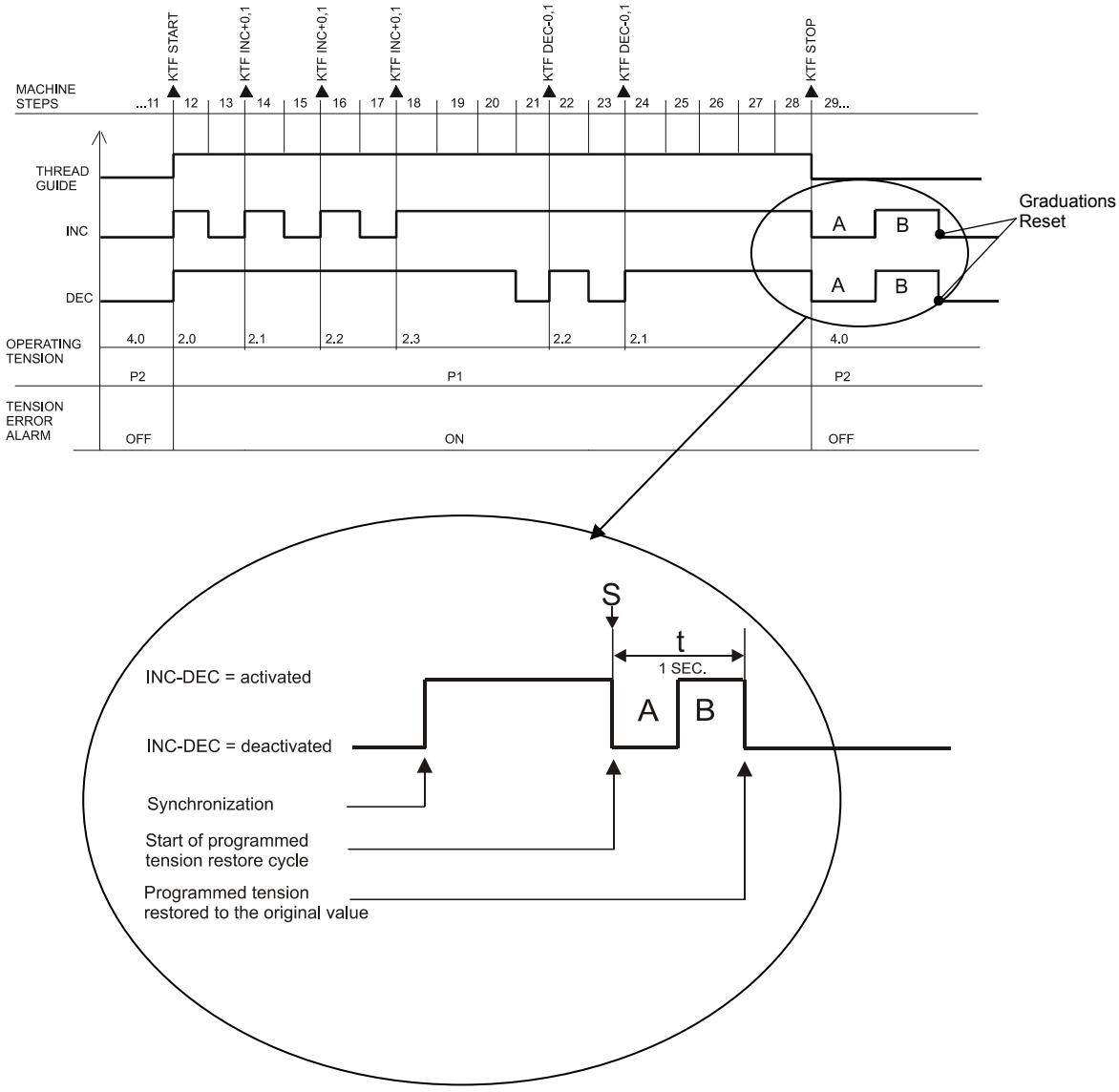


P1 = MAIN TENSION = 2.0 gr.
EXIT TENSION = 4.0 gr.
INC-DEC TENSION = 0.1 gr.

☞ *The time between two INC/DEC commands must be at least 60 msec.*

Application: MEDICAL SOCKS

- Reset of graduated tension synchronized through a defined sequence of INC/DEC *(deactivation/activation/deactivation);*
- "Error Tension" Alarm active only when the ULTRAFEEDER 2 device operates with P1 tension.

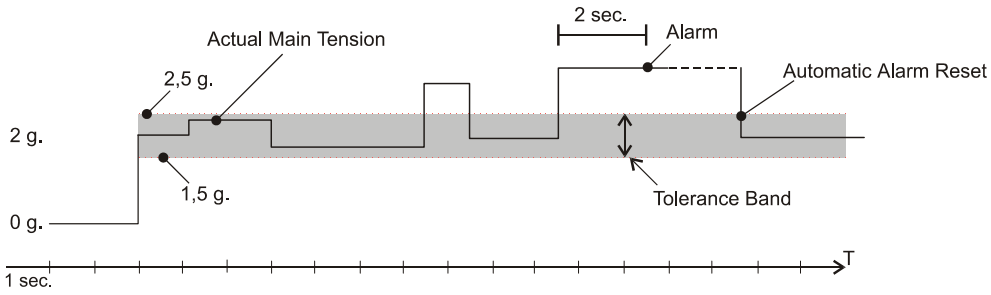


☞ *The A and B pulses, must not necessarily have the same duration, however it is important that their duration is not less than 60 msec.*
If the two pulses A and B occur in a time less than 1 second, the programmed tension will be restored to the original value, always 1 second after the time S.

Management of "Tension Error" Alarm

EXAMPLE

- The ULTRAFEEDER 2 generates the "Error Tension" Alarm when the tension goes out of the programmed tolerance band and automatically resets the alarm as soon as the tension returns within the programmed tolerance band.
- "Error Tension" Alarm active only when the ULTRAFEEDER 2 device operates with P1 tension *(MAIN TENSION)*



Main Tension: 2.0 g.
Error Tension: ± 0.5 g.
Time Alarm: 2.0 sec.

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4 – ULTRAFEEDER 2 TROUBLESHOOTING AND MAINTENANCE

Indications Provided by the Red LEDs on ULTRAFEEDER 2 Device

Status of ULTRAFEEDER 2 device	 **Rear**	
Identification	BLINKING	GREEN/RED ALTERNATE FLASHING
ERROR E2	BLINKING	GREEN/RED ALTERNATE FLASHING
MOTOR LOCKED *(with CONTROL key)**(*)***	ON	ON
ERROR TENSION	BLINKING	GREEN/RED ALTERNATE FLASHING
Master 1 and Slave 1 identification		 steady lit on Master 1 (*in P1*)  steady lit on Slave 1 (*when linked to Master 1*),  blinking (*when Slave 1 is in P1 but it does not receives data from Master 1*)
Master 2 and Slave 2 identification		Same as above but with simultaneous lighting of  and 

(*) This condition is obtained with INC/DEC disabled, i.e. when you are working with the tension defined in P2. If you work with the tension defined in P1, even if you press the Control key, both LEDs remain off. However, pressing the Control key, the tension defined in P1 will be displayed.

☞ *To interpret the failure condition and restore the normal operating conditions, please refer to the following table.*

Troubleshooting on ULTRAFEEDER 2 Devices

Faults	Causes	Solutions
The ULTRAFEEDER 2 display is blank	System powered off	❖ Check that the I/O connector is correctly plugged in and that there is a 24 Vdc power voltage on pins 1-2. ❖ Check the protection fuse on power supply.
E2 displayed on ULTRAFEEDER 2 display	1) Motor locked 2) Temporary triggering of internal protections	1) Check if the motor is correctly turning; detach the feeding wheel to remove possible yarn residuals preventing the motor from turning correctly Correctly thread the ULTRAFEEDER 2 device as shown on page 2.22 2) Turn the electrical supply of device OFF and then ON again ☞ ***If you cannot locate the cause of failure, please contact your BTSR reseller (it could be necessary to send the device to the BTSR repair centre).***
E3 displayed on ULTRAFEEDER 2 display	1) Presence of yarn residuals under the loading cell. 2) OFFSET value of ULTRAFEEDER 2 device out of adjustment	1) Clean the loading cell sensor, using a light air blow *(max 1 bar)* 2) Perform a correct adjustment of the OFFSET value on ULTRAFEEDER 2 device as described on page 3.15.
ES ES-CONT displayed on ULTRAFEEDER 2 display	1) Internal protection against overcurrents	1) Reset the alarm; if the problem persists, contact your BTSR reseller.
MT-BUS displayed on ULTRAFEEDER 2 display	1) Supply voltage lower than 15 Vdc	1) Check the supply voltage, if the problem persists, contact your BTSR reseller.
CURRENT displayed on ULTRAFEEDER 2 display	1) The current absorbed by the device exceeded the maximum allowed value. (e.g. the yarn is locked)	1) Check the inlet yarn is not locked 2) Check the usage conditions of the systems. ☞ ***If you cannot locate the cause of failure, please contact your BTSR reseller (it could be necessary to send the device to the BTSR repair centre).***
TE displayed on ULTRAFEEDER 2 display	1) The temperature of control board exceeded the maximum expected value	1) Check the usage conditions of the systems. ☞ ***If you cannot locate the cause of failure, please contact your BTSR reseller (it could be necessary to send the device to the BTSR repair centre).***
ERR CAN displayed on ULTRAFEEDER 2 device	Poor communication among the various devices	Check the ULTRAFEEDER 2 communication (see chapter 2) Check for correct configuration (for instance check only the Master 1 has been configured)

Faults	Causes	Solutions
TM displayed on ULTRAFEEDER 2 display	1) The motor temperature exceeded the maximum expected value.	1) Check the usage conditions of the systems. ☞ ***If you cannot locate the cause of failure, please contact your BTSR reseller (it could be necessary to send the device to the BTSR repair centre).***
The machine is not stopped by ULTRAFEEDER 2 in case of yarn breakage	1) The third parameter of **P1** programming menu is deactivated (OFF) 2) The Increment and Decrement controls are not correctly managed within the machine program 3) The Stop function managed by the machine and associated with the ULTRAFEEDER 2 device has not been correctly enabled within the machine program. 4) Wiring problem	1) Check the correct programming of ULTRAFEEDER 2 parameters. 2) Check the machine program handling the INC-DEC controls. The INC-DEC LEDs on power supply must be ON and the “P1” label must be active. 3) Check the machine program handling the STOP input and confirm that it is enabled when the yarn fed by ULTRAFEEDER 2 is in working condition. 4) If the stop led on ULTRAFEEDER 2 and the corresponding stop led on power supply turn on, when the yarn breaks, check the machine connecting cables. ☞ ***To check the correct operation of the ULTRAFEEDER 2’s STOP output press the "Control" key that will turn on both LEDs (front and rear); if this does not occur please contact your BTSR reseller (it could be necessary to send the device to the BTSR repair centre).***
OVERFLOW INC or **UNDERFLOW DEC** displayed on ULTRAFEEDER 2 display	1) Incompatibility between the ULTRAFEEDER 2 programming and the number of increments/decrements generated by the machine program	1) Check the ULTRAFEEDER 2 programming, in particular the INC-DEC tension parameters in **P1**, and the machine program *(check the number of increments/decrements required)*.
The ULTRAFEEDER 2 device does not communicate with SMART MATRIX terminal	1) The identification code of ULTRAFEEDER 2 device is not correct 2) Failure on SMART MATRIX PFU terminal 3) Wiring problem	1) Check that the parameter corresponding to the identification number *(parameter **P3.4**)* is correct; if necessary carry out the numbering procedure using the SMART MATRIX PFU terminal or set directly the identification code on KTF device *(parameter **P3.4**)*. 2) Check the correct operation of SMART MATRIX PFU terminal using the numbering procedure described in the SMART MATRIX PFU manual. 3) Check the wiring starting from "SMART- IN" connector on power supply and on SMART MATRIX PFU terminal.
ASC1010 COM-ERROR displayed on ULTRAFEEDER 2 display	1) Missing communication between main DSP and loading cell DSP.	1) Reset the alarm; if the problem persists, contact your BTSR reseller.

Faults	Causes	Solutions
ASC1010 EEP-ERROR displayed on ULTRAFEEDER 2 display	1) Loss of calibration data	1) Reset the alarm; if the problem persists, contact your BTSR reseller.
WATCHDOG displayed on ULTRAFEEDER 2 display	1) Device internal error	1) Reset the alarm; if the problem persists, contact your BTSR reseller.

☞ *If the fault is not included in this table, please contact your local BTSR reseller, giving a detailed description of the kind of fault and the conditions in which it occurred. In the case where the BTSR Technical Service intervention would be required, before calling it is suggested to take note of the code printed on the faulty device, as this information will make diagnoses for the BTSR technicians easier.*
Example:
Device code ULTRAFEEDER 2 ……

Useful Hints when using the ULTRAFEEDER 2 device on socks or pantyhose production machines

- It is advisable to insert the thread guide when the speed is lower than 200 rpm *(the higher the yarn title, the higher can be the insertion machine speed).*
- It is advisable to exclude the thread guide when the machine speed reaches about 200 rpm.
- During the thread guide insertion/exclusion operation it is advisable to use acceleration/deceleration ramps on machine speed.
- If, using very thin or soft yarns, you experience frequent yarn breakage during machine stop and restart phases with ULTRAFEEDER 2 running, prior to start the machine at the maximum speed, it is advisable to perform 2/3 revs at test *(or jog)* speed, in order to extend the yarn, so that possible yarn over-feedings in the machine stop phase will be eliminated.

☞ *Even if the torque of motor driving the roller rotation is very low and does not involve hazards for the operator safety, it's always advisable to lock the motor prior to operate on KTF/100HPS devices (yarn threading, tilt adjustment of coil separation device, etc.) in order to avoid unexpected motor start-up events.*
To lock the motor, just press the CONTROL + key and check that the STOP red LED turns-on.
At the end of the manual operation press again + and check that the STOP red LED turn-off.

Ordinary Maintenance

The **ULTRAFEEDER 2** devices do not require special maintenance interventions, except a periodical cleaning, depending on the environment condition in which they operate and on the yarn type used.

⚠ For cleaning purposes, do not use solvent, but rather a soft cloth dampened with neutral detergent or alcohol.

Repairs

⚠ Any repair intervention on ULTRAFEEDER 2 devices must be carried out by specialized personnel from BTSR.
Any intervention attempt by non authorized personnel, voids the warranty terms.

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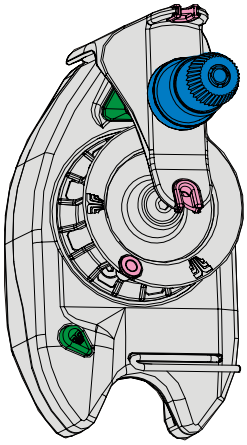
5 – YTT DEVICE

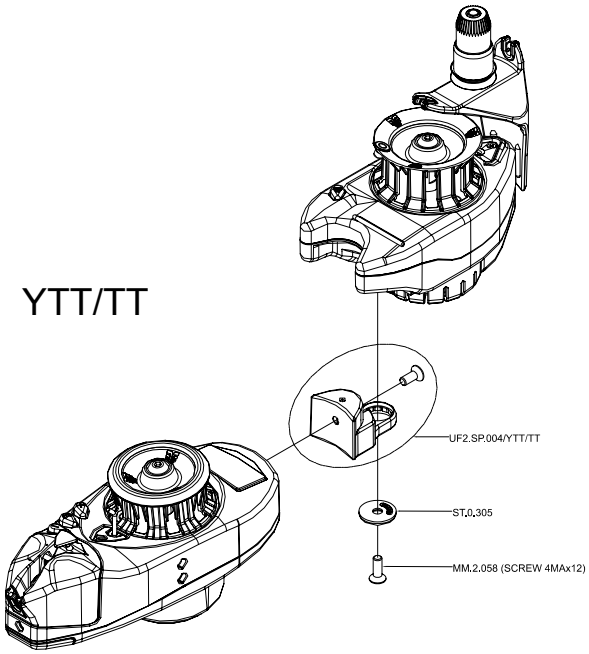
System description



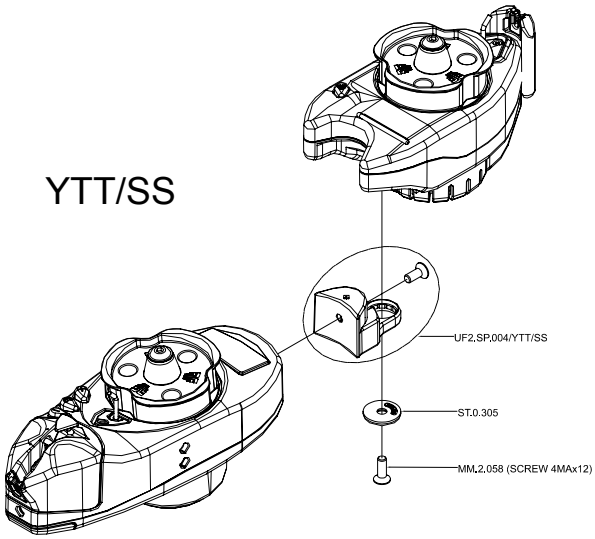
The YTT device (BTSR patent) is an optional accessory which can be connected to the ULTRAFEEDER 2 device and allows improving performance using 2 different operating modes, described on the following pages.

Mechanical installation on ULTRAFEEDER 2

YTT/TT



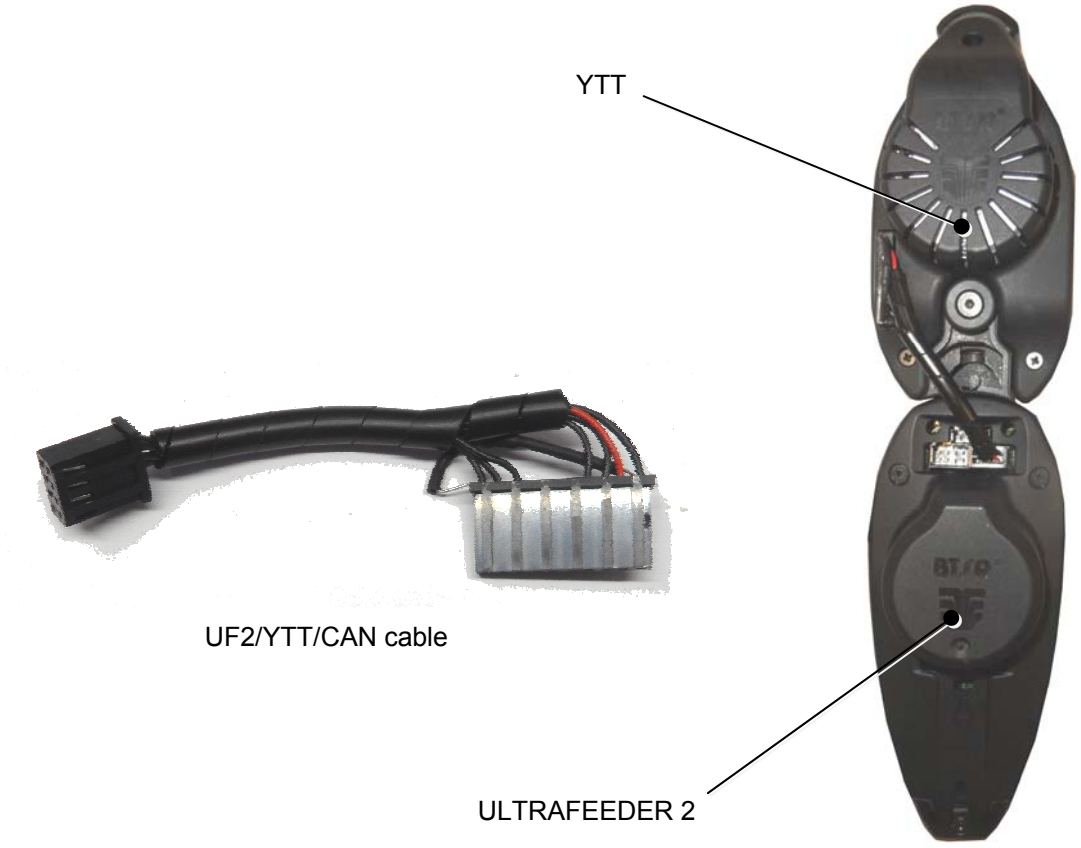
YTT/SS



Note: For the meaning of YTT/TT and YTT/SS modes, please refer to the following paragraph “Operating modes”

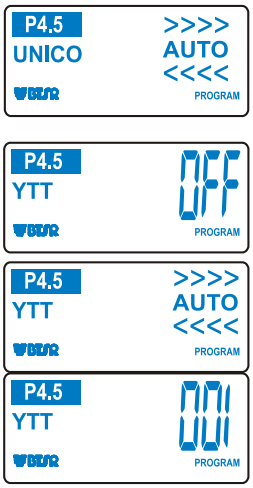
Connection

The YTT device must be connected to the ULTRAFEEDER 2 device using the UF2/YTT/CAN cable, as shown on the following figure:



If the adapter cap is installed on the ULTRAFEEDER 2 device connector (see: ULTRAFEEDER 2 device electrical interface on chapter2), it is necessary to remove it to connect the MA8/10/2FE10/CAN cable.

Once connected, the YTT device must be activated using the parameter P4.5. Moreover, the operator shall assign an identification code to the device.



(+) to select the YTT device.

(E) (3 sec) to enable the YTT device.

(−) (3 sec) to assign the YTT device an identification code.

If more YTT devices are connected to the same CAN bus, these will start flashing. Press the button on the YTT device to be associated to the ULTRAFEEDER 2 device from which the identification code has been programmed.
At this point the 2 devices are uniquely associated.

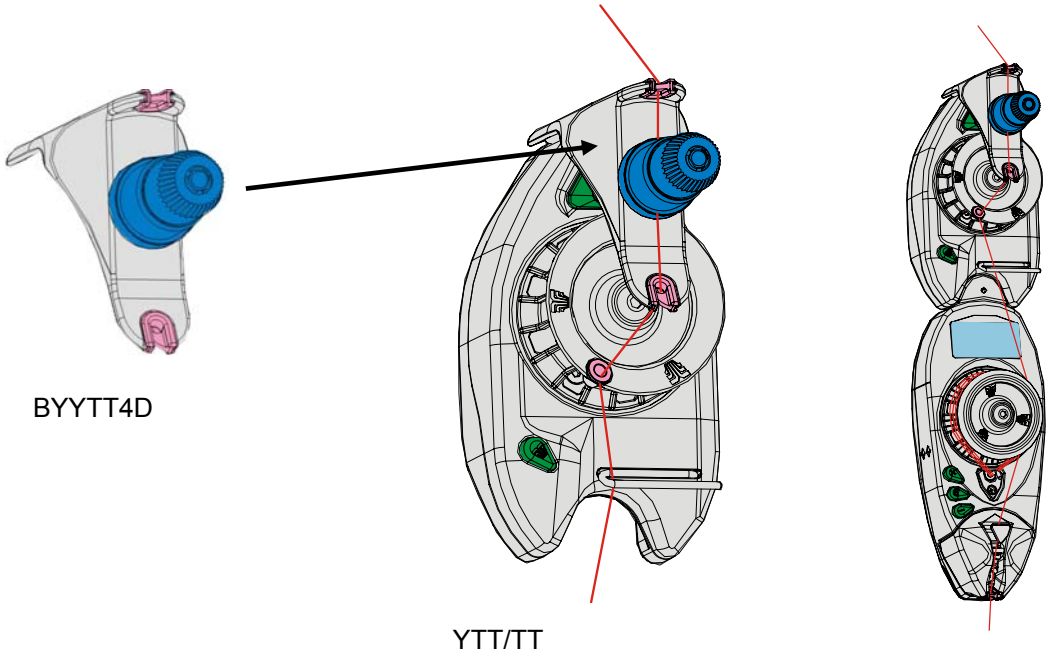
Operating modes

The YTT device can operate in 2 different modes:

- Recovery mode
- Stretch mode.

The operating mode is automatically acquired according to the application set on the ULTRAFEEDER 2 device (parameter P4.2).

Recovery Mode (applications: REVERSE KNIT, REVERSE SOCKS, FLAT KNIT…)
With this choice the YTT device motor works in electric axis mode with the ULTRAFEEDER 2 device in order to keep the yarn stretched between the first and the second wheel. When the machine returns the yarn, this is recovered by the associated YTT device.
To work in Recovery mode, the YTT device requests a further accessory (BYYTT4D – BTSR patent). The following figures show the BYYTT4D accessory and the correct yarn threading for the Recovery mode.

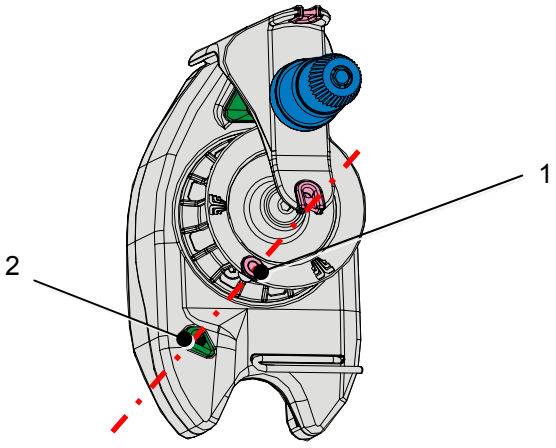


BYYTT4D

YTT/TT

Yarn threading in Recovery mode

After pressing the button on the ULTRAFEEDER 2 device (device locked), align the exit bush (1) with LED button (2).

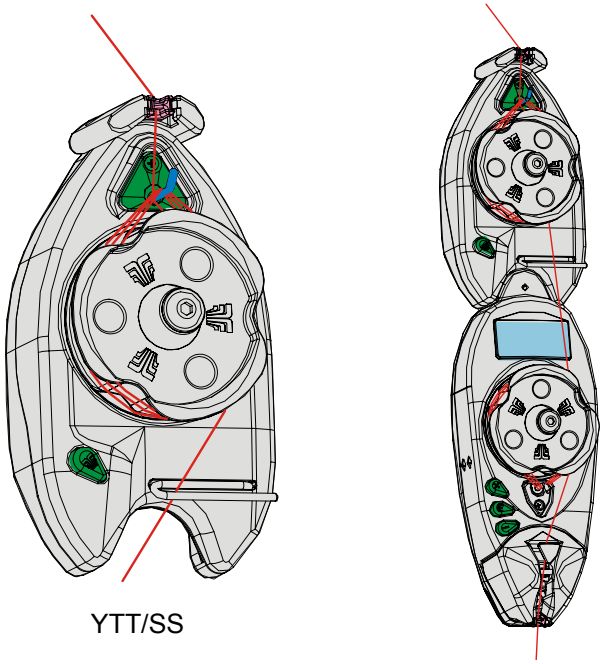


To restart the device press again the button. In this way the ZERO position is learned and saved. From this position the YTT device starts recovering the yarn form the machine and, once all the yarn has been returned, it goes back to the initial position.

Stretch Mode (applications: PANTYHOSE, SEAMLESS…)
In this mode the operator can program a speed ratio between the two devices. This function offers the following advantages:

- for elastic yarns it allows you to stabilize the yarn;
- for rigid yarns it allows you to "stretch" the yarn. Despite having one yarn count on the creel, it is possible to create a stretch variation and then obtain yarns with different counts starting from one count.

The following figure shows the correct yarn threading for the Stretch mode.



YTT/SS

Yarn threading in Stretch mode

The stretch ratio can be defined on parameter P2.4 STRETCH YARN

or to increase or decrease the yarn stretch ratio. *[Allowed values -95.0% ÷ +25.0%].* Positive values indicate that the YTT device motor will turn faster than the ULTRAFEEDER 2 device, while negative values indicate that the YTT device motor will turn more slowly than the ULTRAFEEDER 2 device. The value indicated on the parameter indicates the percentage of speed difference.

Another parameter that can be changed when the YTT device operates in Stretch mode is the parameter P1.5 INC-DEC STRETCH.

With this parameter it is possible to increment/decrement the resolution of the yarn stretch graduated by INC/DEC external pulses *(Upon every INC/DEC pulse, the stretch ratio will be either increased or decreased by the amount indicated by this parameter, with respect to the value set in STRETCH YARN)*

In this mode it is then possible to modulate:

- the tension only (P1.4 active, P1.5 OFF),
- the stretch ratio only (P1.4 OFF, P1.5 active),
- both tension and stretch ratio (P1.4 e P1.5 both active).

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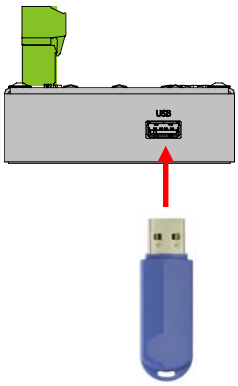
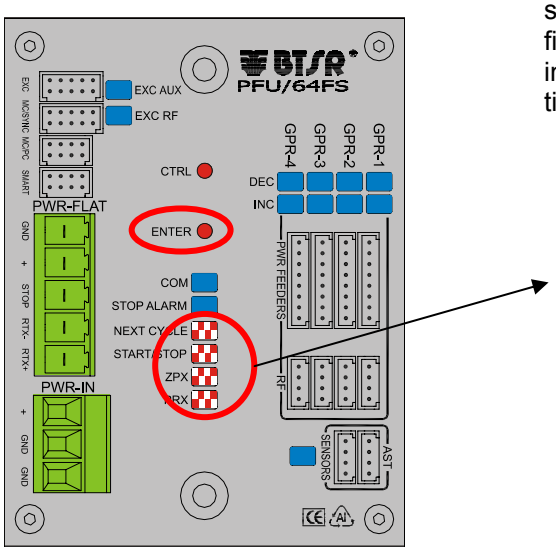
APPENDIX A

PFU/64FS Firmware upgrade through USB dongle

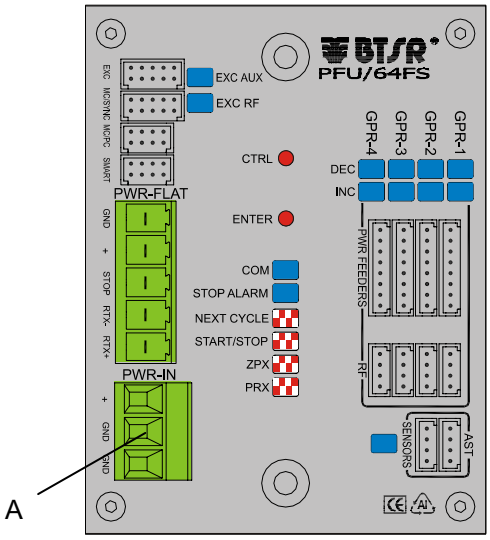
- Create a folder with name UPGRADE on USB dongle and copy the upgrade file provided by (extension ".p32")



- Insert the USB dongle into the relevant slot



- Once you have inserted the USB dongle, the 4 LEDs start blinking. Press the ENTER button to start the firmware upgrade. During the upgrading stage, the 4 indicated LEDs start blinking in sequence one at a time until the procedure is completed:



- If the upgrade is correctly completed, the PFU/64FS power supplier is automatically re-initialized with the new firmware.
- In case of error the indicated LEDs start blinking. Simultaneously press the ENTER and CTRL buttons.
  - If the LEDs stop blinking, the error has been recovered
  - If the LEDs continue blinking, please contact the BTSR Service Department.

- In some error situations it could be necessary to reset the PFU/64FS power supplier, operating as follows:
  - Disconnect the green power connector (A)
  - Simultaneously press and keep pressed the ENTER and CTRL buttons and re-connect the connector (A)
  - All the LEDs of the PFU/64FS power supplier start blinking
  - Release the 2 buttons
  - Now the firmware will be re-initialized.

DISTRIBUTOR

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