# SHS ELECTRONICS

# HT3 Series

## STEPPING MOTOR DRIVE

## - User manual -

▷ English

[Rev. 2.01]

# ⚠️ Security notes

**SHS automation products must be handled, installed and maintained by competent personnel only and Instructed on the installation of automation components, and only for the purposes described in the user manual. Installers must pay particular attention to the potential risks caused by mechanical and electrical hazards.**

It is very important that applications and installations meet all applicable safety requirements.

Each installer is obliged to take responsibility for verifying their knowledge and understanding of everyone the applicable safety standards.

**Any use that does not meet the safety requirements can damage the equipment and injure the user.**

**SHS s.r.l. will not be held responsible, and will not take any responsibility for damage caused by products handled and / or improperly installed, or in cases where the customer has permitted, or performed, modifications and / or repairs not authorized by SHS s.r.l.**

SHS drives are high-performance automation devices capable of generating rapid movements high forces.

Pay close attention, especially in the installation and application development phases.

Use only properly sized equipment for the application.

SHS devices are considered automation components and are sold as finished products to be installed only by qualified personnel and in accordance with all local safety regulations.

Specialists must be able to recognize the possible dangers that may arise from programming, from the modification of the parameter values and, in general, from mechanical, electrical and electronic equipment.

SHS s.r.l recommends always following the safety regulations. Failure to comply with these rules could cause damage to people and / or things.

## *General precautions:*

- This manual is subject to change due to product improvements, changes in specifications or improvements of the manual itself.

- SHS s.r.l. is not responsible for damages to things and / or persons caused by incorrect installations and / or modifications not authorized by the product.

*Damaged control systems must not be mounted or put into operation to avoid injury people and damage to things. Any modification or variation made to the drive systems is forbidden e involves the termination of any right to warranty interventions or any liability obligation.*

# Index

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# 1. TECNICAL CHARACTERISTICS

## 1.1 Installation notes

<div align="center">

⚠️ **ATTENTION** ⚠️

Danger of electric shock.
Only qualified persons can handle the device.

</div>

Check the drive power terminals whenever voltage is removed before working on the device.

## 1.2 DC power supply

|  | Unit | HT320 | HT350 |
|---|---|---|---|
| **Vdc nom** | [V] | 24 | 48 |
| **Vdc max** | [V] | 30 | 70 |
| **Vdc min** | [V] | 18 | 18 |
| **I max** | [A] | 4 | 8 |
| **I min** | [A] | 0.1 | 1.0 |
| **Operating temperature** | [°C] | 0 - 45 | 0 - 45 |
| **Vcc** | [V] | 15 | 15 |
| **Icc max** | [A] | 0.1 | 0.1 |

- **Vdc nom :** Nominal voltage value to which the driver may be powered.
- **Vdc max:** Maximum voltage value to which the driver can operate.
- **Vdc min:** Minimal voltage value to which the driver can operate.
- **I max:** Maximum phase current value.
- **I min:** Minimal phase current value.
- **Operating temperature:** For continuous working with phase current > 6A a forced cooling is necessary.
- **Vcc**: Logic power supply output.
- **Icc max:** Logic power supply current maximum

# 1.3 Inputs & Outputs

Digital inputs and outputs pins are isolated from power
- Single Ended inputs IN1, IN2, IN3 compatible PNP input the common is COMIN_A pin.
- Single Ended inputs IN4, IN5, IN6 are NPN/PNP type selectable through COMIN_B pin.
- Outputs OUT1, OUT2, OUT3 are NPN/PNP type selectable through COMOUT.

Analog inputs ANIN1, ANIN2 pins and outputs ANOUT, VREF pins are not isolated from power.

| IN1, IN2, IN3 | STANDARD | TTL (*) |
|---|---|---|
| LOW LEVEL | 0V to 7V | 0V to 2.5V |
| HIGH LEVEL | 9V to 24V | 3.5V to 5V |
| MAX CURRENT | 6mA | 5mA |

| IN4, IN5, IN6 | STANDARD | TTL (*) |
|---|---|---|
| LOW LEVEL | 0V to 7V | 0V to 2.5V |
| HIGH LEVEL | 9V to 24V | 3.5V to 5V |
| MAX CURRENT | 10mA | 4mA |

| OUTPUTS | | VOLTAGE LEVEL |
|---|---|---|
| PNP OUTPUT | ON | COM_OUT VOLTAGE - 2V |
| | OFF | 0V |
| NPN OUTPUT | ON | 2V |
| | OFF | COM_OUT VOLTAGE |

| ANALOG INPUTS | VALUE |
|---|---|
| RANGE | 0 to 10V |
| IMPEDANCE | 150 KΩ |

| ANALOG OUTPUTS | VALUE |
|---|---|
| RANGE | 0 to 10V |
| MAX CURRENT | 10 mA |

(*) Special Release

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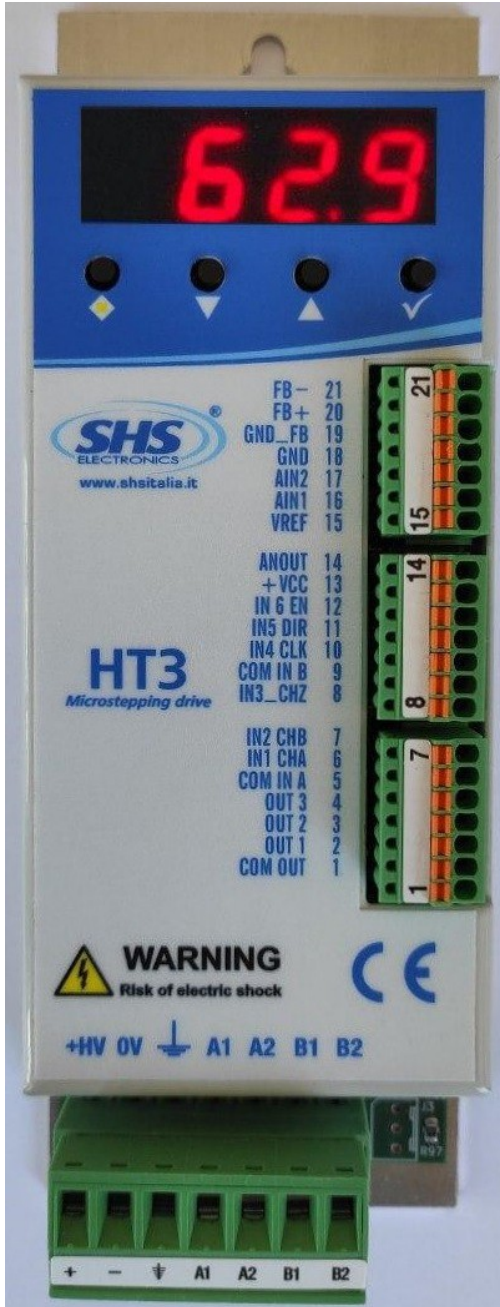
# 2. CONNECTIONS

## 2.1 Input/Output connector

| J2 | SIGNAL | FUNCTION |
|----|--------|----------|
| 21 | FB- | Fieldbus + |
| 20 | FB+ | Fieldbus - |
| 19 | GND_FB | 0V Fieldbus |
| 18 | GND | 0V (+VCC, VREF, ANIN1,2, ANOUT) |
| 17 | ANIN2 | Analog input 2 |
| 16 | ANIN1 | Analog input 1 |
| 15 | VREF | Reference voltage output 10V |
| 14 | ANOUT | Analog output |
| 13 | +VCC | Auxiliary voltage output 15V |
| 12 | IN6_EN | Input 6 / ENABLE |
| 11 | IN5_DIR | Input 5 / DIRECTION |
| 10 | IN4_CLK | Input 4 / CLOCK |
| 9 | COMIN_B | IN4,5,6 Common Reference |
| 8 | IN3_CHZ | Input 3 / Encoder Z |
| 7 | IN2_CHB | Input 2 / Encoder B |
| 6 | IN1_CHA | Input 1 / Encoder A |
| 5 | COMIN_A | IN1,2,3 Common Reference |
| 4 | OUT3 | Output 3 |
| 3 | OUT2 | Output 2 |
| 2 | OUT1 | Output 1 |
| 1 | COM OUT | OUT1,2,3 Common reference |

## 2.2 Power supply / Motor connector

| J1 | |
|----|----|
| SIGNAL | FUNCTION |
| B2 | B2 motor phase |
| B1 | B1 motor phase |
| A2 | A2 motor phase |
| A1 | B1 motor phase |
| | |
| 0V | 0V power supply |
| +HV | DC power supply input |
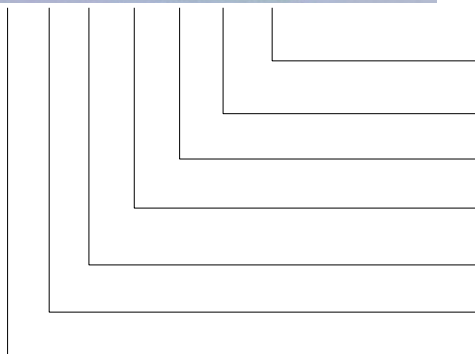
# 2.3 Enable Input

To switch on the power of the motor must be connect a signal to Enable Input (IN6).
Without this signal the drive stop the motor, there is not a deceleration ramp, and the motor phases current goes to zero.
It's possible have a drive where the IN6 is a Disable Input, see drive models table option.
It's possible to remove enable/disable function and have an other spare input, see drive models table option.
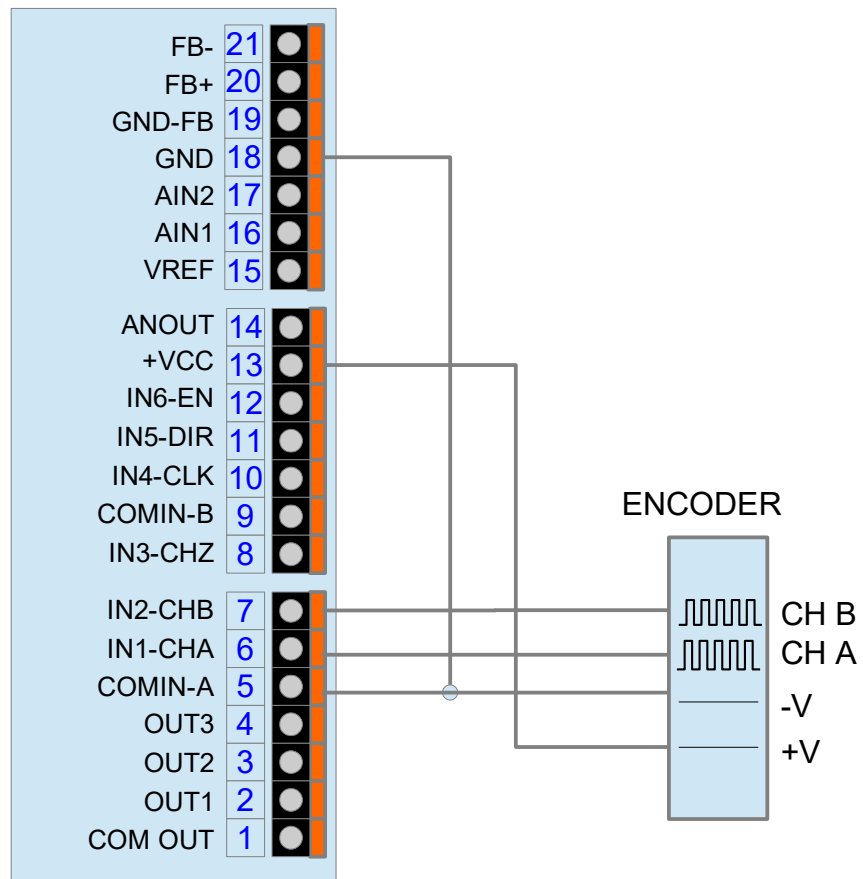
| SIGNAL | FUNCTION |
|--------|----------|
| IN6 | Enable |

# 2.4 Encoder

Encoder connection to check the motor position.

| SIGNAL | FUNCTION |
|--------|----------|
| IN1 | CH A |
| IN2 | CH B |

TYPICAL APPLICATION

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# 3. SETTINGS

## 3.1 Parameters setting

By using the buttons below the display (hereinafter referred to as [◆] , [▼], [▲] ,[v]) you can parameterize the drive:

- To access to main menu, press [v] per two seconds, it will visualize the first available parameter.
- From main manu to select the desired parameter press the button [▼] or [▲].
- To visualize the actual value of parameter press [v].
- From the parameter to change the value press [▼] or [▲].
- From the parameter to store the value press the button [v] for two seconds and it will appear "memo" on the display.
  Some change require an automatic reset of the drive, or to a wait time to be effective.
- From the parameter to come back at main menù without modify any conditions, press [◆].
- From the main menu to go out press [◆].
- The password parameter use keyb  [◆] to move the pointer beetwen the characters.

## 3.2 Display messages

| DISPLAY | Description |
|---------|-------------|
| rdy | Drive OK, motor stop |
| run | Motor running |
| dis | Drive disabled |
| temp | Over temperature Error |
| uvoL | Under Voltage Error |
| ovoL | Over Voltage Error |
| ocur | Over Current Error |
| perr | Generic Error |
| rSt | Reset phase |

In case of error, the drive will remove power to the motor.
To reset the over current and generic errors it's necessary or switch off and on the drive.
To reset over temperature, under voltage or over voltage errors it's necessary have the correct value.

# 4. FUNCTION MODES

It is possible to set different function modes by the "Mode" parameter.

| Mode | DESCRIPTION |
|------|-------------|
| " PD" | Step/direction command |
| "Modb" | Modbus Fieldbus protocol |
| " Win" | Winstar Fieldbus protocol |
| "CanO" | CanOpen Fieldbus protocol |

Basic Drive in Step Direction can't have Mode option.
Winstar and Modbus drive can have Step/direction mode.

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# 4.1 Step Direction Mode " PD"

In Step/direction mode the drive execute a single step for each rising edge of the step-in signal
IN4 step in clock (Maximum frequency 60KHz)
IN5 defines the direction rotation.
IN6 enable the drive.

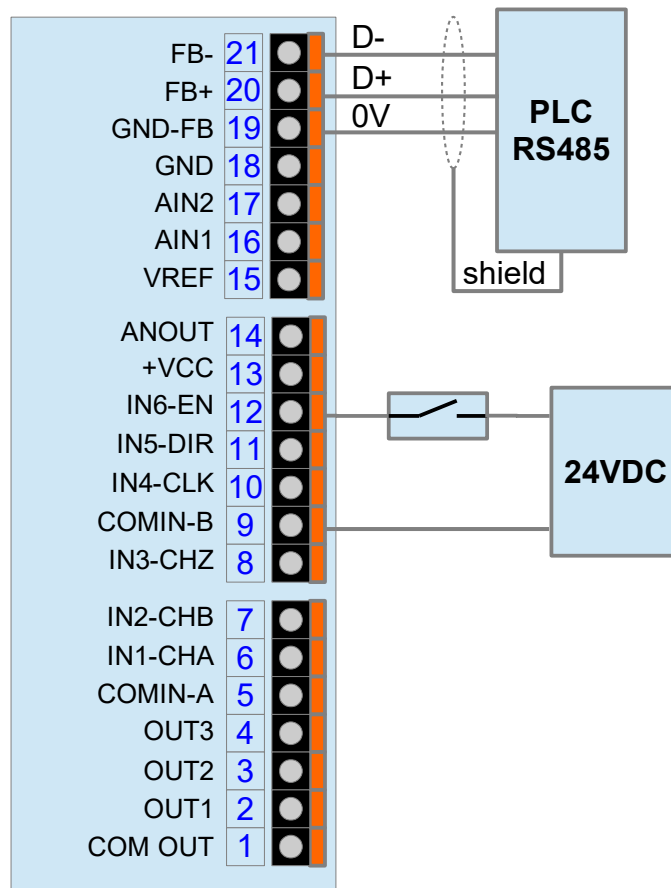| PARAMETERS | Function | Values | Reset |
|---|---|---|---|
| Opar | Reset Eeprom values | On | Unaffected |
| curr | Set the phase current [mA] | See drive models table option | 1000 |
| res | Set the resolution [1/n steps] | 1/1, 1/2, 1/4, 1/8, 1/16 | 1/2 |
| redi | Set the reduction current value | Zero Current, Imax/4, Imax/2, Imax | Imax/4 |
| redt | Set the reduction current time | 10ms to 300ms | 10 |
| Firm | Firmware Release | Variable | Unaffected |
| pass | Password | Alphanumeric value | "----" |

TYPICAL APPLICATION

# 4.2 Modbus Mode "MODB"

The drive can support MODBUS-RTU protocol.
It is possible to set Address, Baud-rate and Parity.
Data format is N,8,1.

| PARAMETERS | Function | Values | Reset |
|---|---|---|---|
| Opar | Reset Eeprom values | On | Unaffected |
| curr | Set the phase current [mA] | See drive models table option | 1000 |
| baud | BaudRate RS485[Kbps] | 9.6, 19.2, 38.4, 57.6, 115.2 | 19.2 |
| par | Parity RS485 | " no", "even", " odd" | " no" |
| Addr | Node Modbus Address | 0 to 31 | 1 |
| Mode | Mode Function | " PD", "Modb" | "Modb" |
| res | Set the resolution [1/n steps] | 1/1, 1/2, 1/4, 1/8, 1/16 | 1/2 |
| redi | Set the reduction current value | Zero Current, Imax/4, Imax/2, Imax | Imax/4 |
| redt | Set the reduction current time | 10ms to 300ms | 10 |
| Firm | Firmware Release | Variable | Unaffected |
| pass | Password | Alphanumeric value | "----" |

TYPICAL APPLICATION

# 4.3 Register table

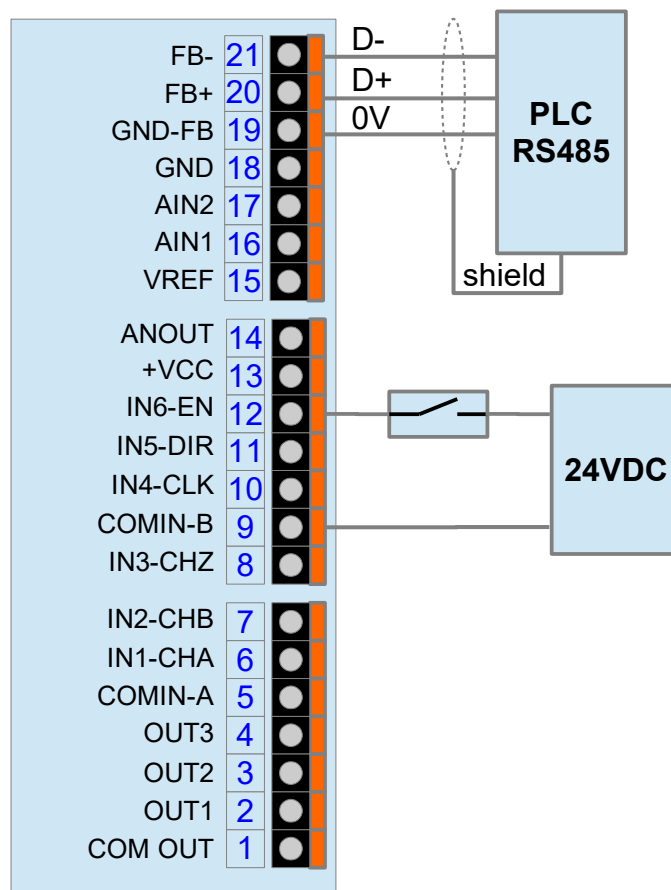| REGISTERS | | | |
|---|---|---|---|
| **ADDRESS** | **NAME** | **ACCESS** | **DESCRIPTION** |
| 0x0000 (H) 0x0001 (L) | CONTROL WORD | R/W | 00 = Stop motor<br>01 = Motor Start CW: it executes the quote preload in the PRESET POSITION register<br>02 = Motor Start CCW: it executes the quote preload in the PRESET POSITION registers<br>03 = Load Position: set the drive actual position with PRESET POSITION register<br>06 = Jog forward : infinite movement CW<br>07 = Jog backward: infinite movement CCW<br>08 = Absolute movement: brings the motor into position loaded into logs 0002,0003<br>09 = Reset: Stop motor and set default parameters<br>Comands 01, 02, 06, 07, 08:<br>If the drive is in protection or disabled, the command will not be executed and the response will be ERROR: ADD 0x90 0x03 CHK CHK |
| 0x0002 (H) 0x0003 (L) | PRESET POSITION | R/W | Position to be reloaded or relative displacement value to be performed (2 word)<br>[1/128 step if encoder mode=0 else encoder steps  x 4] |
| 0x0004 (H) 0x0005 (L) | MAXIMUM FREQUENCY | R/W | SETTING OF MAXIMUM FREQUENCY [Hz]<br>(range 1-40000) |
| 0x000A (H) 0x000B (L) | MINIMUM FREQUENCY | R/W | SETTING OF MINIMUM FREQUENCY [Hz]<br>(range 1-10000) |
| 0x000C (H) 0x000D (L) | ACCELERATION | R/W | SETTING OF RAMP INCLINATION (from 0 to 10KHz) [ hundredth of second ]<br>(range 1-1000) |
| 0x000E (H) 0x000F (L) | RESOLUTION | R/W | SETTING OF MOTOR RESOLUTION:<br>0 = 1 / 1   (200 step/rev)<br>1 = 1 / 2   (400 step/rev)<br>2 = 1 / 4   (800 step/rev)<br>3 = 1 / 8   (1600 step/rev)<br>4 = 1 / 16  (3200 step/rev)<br>(range 0-4) |
| 0x0010 (H) 0x0011 (L) | CURRENT | R/W | Motor Current [mA] |
| 0x0012 (H) 0x0013 (L) | REDUCTION MODE | R/W | SETTING OF ELECTRIC CURRENT REDUCTION<br>0 =reduction to 100%<br>1 = no reduction<br>2 =reduction to 25%<br>3 =reduction to 50%<br>(range 0-3) |

| REGISTERS | | | |
|---|---|---|---|
| **ADDRESS** | **NAME** | **ACCESS** | **DESCRIPTION** |
| 0x0014 (H) 0x0015 (L) | REDUCTION TIME | R/W | Automatic current reduction time with motor stopped [1=32 ms] (range 1-255) |
| | | | |
| 0x1000 (H) 0x1001 (L) | ACTUAL POSITION | R | Reading present position [1/128 step if encoder mode=0 otherwise encoder steps x 4] |
| 0x1002 (H) 0x1003 (L) | POWER SUPPLY | R | Supply Voltage [V] |
| 0x1018 (H) 0x1019 (L) | FIRMWARE RELEASE | R | Firmware release version |
| 0x1100 (H) 0x1101 (L) | STATUS WORD | R | Input/output/function status Bytes drive status BIT 0 = IN4 (1=input enabled) BIT 1 = IN5 (1=input enabled) BIT 2 = IN6 – ENABLE (1=drive enabled) BIT 3 = IN1 (1=input enabled) BIT 4 = IN2 (1=input enabled) BIT 5 = IN3 (1=input enabled) BIT 6 = OUT1 BIT 7 = OUT2 BIT 8 = OUT3 BIT 9 = MOTOR STATUS (1=motor is running) |
| 0x1200 (H) 0x1201 (L) | ERROR CODE | R | Error condition Error bit codes: BIT 1 = Drive disable BIT 2 = Overcurrent BIT 3 = Overtemperature BIT 4 = Undervoltage BIT 5 = Overvoltage BIT 9 = Fult Power BIT 16 is '0' drive is Ready, '1' drive protection active |

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# 4.4 Winstar Mode " Uin"

The drive can support WINSTAR proprietary protocol.
It is possible to set Address, Baud-rate and Parity.
Data format is N,8,1.

| PARAMETERS | Function | Values | Reset |
|---|---|---|---|
| Opar | Reset Eeprom values | On | Unaffected |
| curr | Set the phase current [mA] | See drive models table option | 1000 |
| baud | BaudRate RS485[Kbps] | 9.6, 19.2, 38.4, 57.6, 115.2 | 19.2 |
| par | Parity RS485 | " no", "even", " odd" | " no" |
| Addr | Node Modbus Address | 0 to 31 | 1 |
| Mode | Mode Function | " PD", " Uin" | " Uin" |
| res | Set the resolution [1/n steps] | 1/1, 1/2, 1/4, 1/8, 1/16 | 1/2 |
| redi | Set the reduction current value | Zero Current, Imax/4, Imax/2, Imax | Imax/4 |
| redt | Set the reduction current time | 10ms to 300ms | 10 |
| Firm | Firmware Release | Variable | Unaffected |
| pass | Password | Alphanumeric value | "----" |

TYPICAL APPLICATION

# 4.5 Command table

| REGISTERS | | | |
|---|---|---|---|
| COMMAND | DESCRIPTION | COMMAND PARAMETER | DRIVE ANSWER |
| 0x01 | DRIVE RESET: motor stop spinning, Initialize speed and set ramp to 0 | No | *byte_ack* |
| 0x02 | SOFTWARE START: By sending this command, motor is running according to the transmitted values (quote, speed and ramp). | No | *byte_ack* |
| 0x10 | Request for software version. | No | *byte_ack + byte_start+ byte_nbyte_address+ 0xNN+byte_chksum NN=software version* |
| 0x11 | IMMEDIATE STOP: The motor slows down, according to the set ramp, until it stops. | No | *byte_ack* |
| 0x12 | READING OF CURRENT POSITION The drive returns the instantaneous position of the motor, upon receipt of the command, in 4 bytes. | No | *byte_ack+byte_start+ byte_nbyte_address+byte1+byte2+byte3+ byte4+byte_chksum* |
| 0x16 | POWER VOLTAGE READING [V] | No | *byte_ack + byte_start+ byte_nbyte_address+ 0xNN+byte_chksum NN=power supply* |
| 0x17 | RAMP SETTING: like the command 0x22 with 2 bytes (maximum ramp 10000). If motor is running, this parameter will be acquired to the next motion command. | 2 bytes which indicates the ramp inclination (from 1 to 10000) expressed on hundredth of second (1/100 sec) | *byte_ack* |
| 0x20 | SETTING OF MINIMUM FREQUENCY. If motor is running, this parameter will be acquired to next motion command. | 2 bytes, which indicate the minimum frequency (range 1 to 10000 Hz) | *byte_ack* |
| 0x21 | SETTING OF MAXIMUM FREQUENCY. If motor is running, this parameter will be acquired to next motion command. | 2 bytes, which indicate the maximum frequency (range 1 to 40000 Hz) | *byte_ack* |
| 0x22 | SETTING OF RAMP INCLINATION: indicates the ramp inclination (from 1 to 255) expressed on hundredth of second (1/100 sec). If motor is running, this parameter will be acquired to the next motion command. | 1 bytes which indicates the ramp inclination (from 1 to 255) expressed on hundredth of second (1/100 sec) | *byte_ack* |
| 0x23 | SETTING OF HOME POSITION: Drive associates the entered value to home position of the motor at the end of homing procedure (0xAF command) | 4 bytes, which indicate the home position (expressed in 1/128 step) | *byte_ack* |

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| REGISTERS | | | |
|---|---|---|---|
| **COMMAND** | **DESCRIPTION** | **COMMAND PARAMETER** | **DRIVE ANSWER** |
| 0x26 | SETTING OF MOTOR RESOLUTION: the value on the motion commands will be expressed on 1/128 step (25600 = 1 full step/rev) (If motor is running, this parameter will be acquired to the next motion command) | 1 byte, which indicates motor resolution. If the sent byte = 0 → full step mode = 1 → 1/2 step mode = 2 → 1/4 step mode = 3 → 1/8 step mode = 4 → 1/16 step mode | *byte_ack* |
| 0x27 | SETTING OF ELECTRIC CURRENT REDUCTION | 1 byte, which indicates time and mode of current reduction. The first 6 bits indicate time after which current reduction (from 0 to 63) must occur on a time basis of 32 | *byte_ack* |
| 0x29 | TRIGGER START (LOGIC AND): It defines the Input or the inputs and the respective Levels, which must be enabled for carrying out the START by an external command. | 1 byte: the 4 less significant bits indicate the input or the inputs, which must be enabled for STARTING (1 input enabled). The next 4 bits indicate the level of these inputs (1=active input at high level) | *byte_ack* |
| 0x2A | TRIGGER STOP (LOGIC AND): It defines the input or the inputs and the respective levels, which must be enabled for carrying out the STOP by an external command. | 1 byte: the 4 less significant bits indicate the input or the inputs, which must be enabled for STOPPING (1= enabled input). The next 4 bits indicate the level of these inputs (1=input active at high level) | *byte_ack* |
| 0x30 | ABSOLUTE POSITIONING (RELATIVE TO THE HOME POSITION) | 4 bytes, which indicate the absolute position to reach (expressed on 1/128 step or encoder steps). (values admitted: from -2147483647 to 2147483647) | *byte_ack* |
| 0x31 | RELATIVE POSITIONING | 4 bytes, which indicate the carrying out positioning with respect to the present position of the motor (expressed on 1/128 step or on steps encoder) (values admitted: from -2147483647 to 2147483647) | *byte_ack* |
| 0x32 | INFINITE MOTION: When sending this command, motor is running at the speed entered in the specified rotation direction. | 1 byte, which indicates the rotation direction if = 0 CW if = 255 CCW | *byte_ack* |

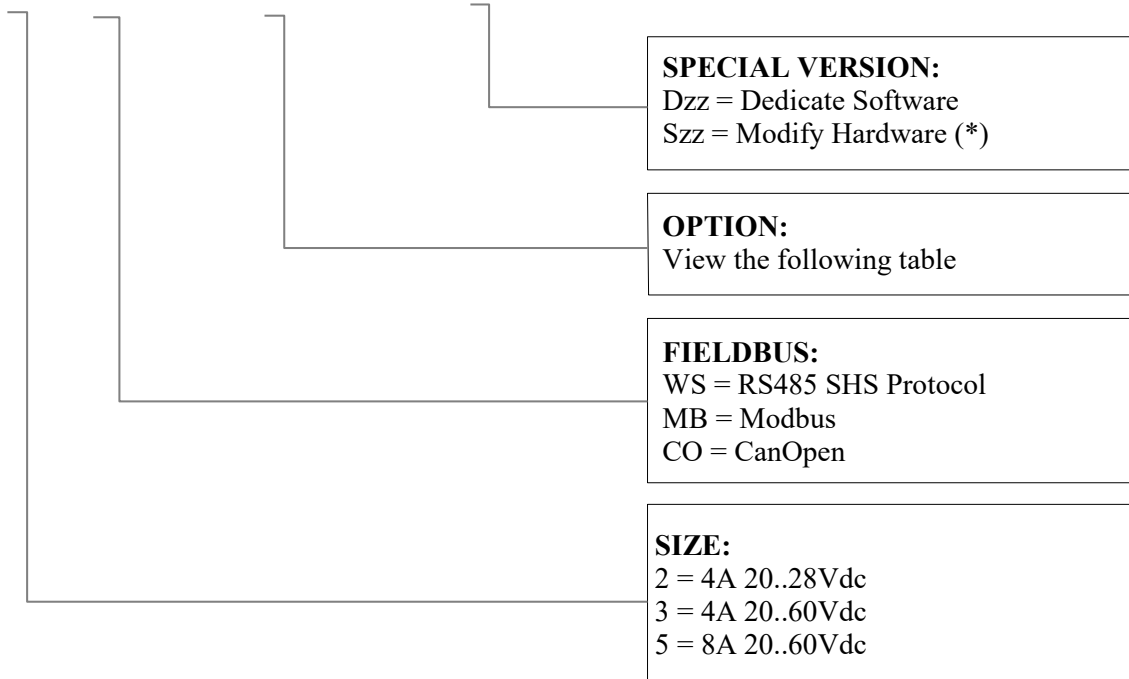| REGISTERS | | | |
|-----------|-------------|-------------------|--------------|
| **COMMAND** | **DESCRIPTION** | **COMMAND PARAMETER** | **DRIVE ANSWER** |
| 0xA0 | ZERO AT FLIGHT (LOGIC AND): It defines the input or the inputs and the respective levels, which must be enabled for carrying out zeroing of the value in the present motor position, when this condition occurs, and the value to be done on occasion of this condition. | 5 bytes: - the 4 less significant bits indicate the input or the inputs, which must be enabled for doing the ZERO AT FLIGHT (1=input enabled), the next 4 bits indicate the level of these inputs (1=input active at high level) - next 4 bytes: these indicate the positioning to be done in the same rotation direction since when the condition expressed in the first byte occurs (values admitted: 0 to 2147483647) | *byte_ack* |
| 0xA3 | 2 BYTES DRIVE STATUS | No | *byte_ack+byte_start+ byte_nbyte_address+ Byte_statusH+ Byte_statusL+byte_chksum*<br><br>*Byte_statusH:*<br>BIT0: IN4 (1 input active)<br>BIT1: IN5 (1 input active)<br>BIT2: IN6 (1 input active)<br>BIT3: IN1 (1 input active)<br>BIT4: IN2 (1 input active)<br>BIT5: IN3 (1 input active)<br>*Byte_statusL:*<br>BIT0: Moto (1 motor ON)<br>BIT2: Protection (1 alarm)<br>BIT5: OUT1 (1 output active)<br>BIT6: OUT2 (1 output active)<br>BIT7: OUT3 (1 output active) |
| 0xA6 | MOTION TO ZERO VALUE | No | *byte_ack* |
| 0xA8 | CURRENT SETTING (2000=2A). Entering a wrong value the answer will be byte_nack. | 2 bytes, which indicate the current value | *byte_ack* |

| REGISTERS | | | |
|---|---|---|---|
| **COMMAND** | **DESCRIPTION** | **COMMAND PARAMETER** | **DRIVE ANSWER** |
| 0xAA | SETTING OF RELATIVE VALUE (WITHOUT ANY POSITIONING) | 4 bytes, which indicate the relative positioning with respect to the present position of the motor to be carried out at the next SOFTWARE START or TRIGGER START expressed in 1/128 step (values admitted: from -2147483647 to 2147483647) | *byte_ack* |
| 0xAB | 2 BYTES DRIVE STATUS | No | *byte_ack+byte_start+ byte_nbyte_address+ Byte_status+byte_chksum*<br><br>*Byte_status:*<br>BIT0: Moto (1 motor ON)<br>BIT1: Zero at flight (1 active, 0 not active or executed)<br><br>BIT2: Protection (1 alarm)<br>BIT3: IN1 (1 input active)<br>BIT4: IN2 (1 input active)<br>BIT5: IN3 (1 input active)<br><br>BIT6: OUT1 (1 output active)<br>BIT7: OUT2 (1 output active) |
| 0xAE | SETTING OF ABSOLUTE POSITION: It joins to the present position the command value. | 4 bytes which show absolute position to join to present position (expressed in 1/128 step) (-2147483647 to 2147483647) | *byte_ack* |
| 0xAF | AXIS ZEROING: It defines the input and relative level where zero switch will be connected and it carries out axis zeroing. The zeroing phase includes: CCW motor start; the search of zero switch with rotation at maximum speed; stop on zero switch; disengagement of zero switch at min. speed and zeroing of absolute position. | 1 byte: the less 4 significant bits show the input where zero switch will be connected (1= enabled input), next 4 bits show the level of this input (1=activated input at high level) | *byte_ack* |

# Command table (cnt)

| REGISTERS | | | |
|---|---|---|---|
| **COMMAN** | **DESCRIPTION** | **COMMAND PARAMETER** | **DRIVE ANSWER** |
| 0xB0 | LIMIT SWITCH (LOGIC AND): It defines the input and the relative level where the limit switch will be connected. When the switch will be intercepted, it will cause the immediate motor stop and it allow only the opposite wise motion. The command activates this function until its disengagement through a new command with no specified input (Parameter=0). By using two switches (limit switch+ and limit switch-) they must be connected in series) | 1 byte: the less 4 significant bits show the input where limit switch will be connected.<br>(1=enable input).<br>Next 4 bits show the level of this input (1=activated input at high level).<br>By using two switches (limit switch+ and limit switch-) they must be connected in series) | *byte_ack* |
| 0xB2 | ZERO AT FLIGHT MASK QUOTE: To enable zero at flight trigger after this quote. | 4 bytes, which indicate the Mask quote (expressed in 1/128 step) | *byte_ack* |
| 0xB6 | SETTING OF ABSOLUTE VALUE | 4 bytes, which indicate the | *byte_ack* |
| 0xB7 | LIMIT SWITCH (LOGIC OR): It defines the input and the relative level where the limit switch will be connected. When the switch will be intercepted, it will cause the immediate motor stop and it allow only the opposite wise motion. The command activates this function until its disengagement through a new command with no specified input (Parameter=0). | 1 byte: the less 4 significant bits show the input where limit switch will be connected. | *byte_ack* |
| 0xC0 | TRIGGER MODE<br><br>Only for start trigger, stop trigger and zero at flight trigger | 1 byte:<br>0=one shot<br>1=trigger always enabled | *byte_ack* |
| 0xCA | OUTPUTS SET:<br>Byte to send for outputs set/reset<br>0x00 – standard outputs:<br>OUT1 in position<br>OUT2 ready out OUT3 not used<br>0x10 – reset OUT1<br>0x11 – set OUT1<br>0x20 – reset OUT2<br>0x21 – set OUT2<br>0x30 – reset OUT3<br>0x31 – set OUT3 | Next 4 bits show the level of this input (1=activated input at high level). | *byte_ack* |

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ENG

# 5. HT3 MODELS CODE

# HT3x1KK - yyyyy / Zzz

**SPECIAL VERSION:**
Dzz = Dedicate Software
Szz = Modify Hardware (*)

**OPTION:**
View the following table

**FIELDBUS:**
WS = RS485 SHS Protocol
MB = Modbus
CO = CanOpen

**SIZE:**
2 = 4A 20..28Vdc
3 = 4A 20..60Vdc
5 = 8A 20..60Vdc

The defaul configuration it:
- Step Direction Command
- Input from 12 to 24V
- Power and Signal Pluggable Connector

| CODE | yyyyOPTION | |
|------|-----------|---|
| 1 | Encoder TTL | |
| 2 | Input TTL | |
| 4 | Display Bootm | |
| 8 | EEprom special Firmware | |
| 16 | Signal crimp connector | |
| 32 | Power Screw connector | |
| 64 | IN6 Disable input | |
| 128 | IN6 spare input | |

(*) not available for this drive
EXAMPLE 1: the default configuration will become option 0 ( 00000 )
EXAMPLE 2: TTL Input + EEprom Firmware, will become option 2+8 = 10 ( 00010 )