



SERIAL INTERFACE
Series SSW-03 and 04

SERIAL
COMMUNICATION
MANUAL
SSW-03 and 04

CODE 0899.4457 E/2

MANUAL OF THE SERIAL COMMUNICATION SSW-03 and 04

Series: SSW-03 and 04
Software: Version 4.XX
0899.4657 E/2

ATTENTION!

It is very important to check if the Soft-Starter Software version is the same as indicated above.

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This Manual contains all necessary information for the correct use of the Serial Communication of the Soft-Starters SSW-03 and SSW-04
This Manual has been written for qualified personnel with suitable training or technical qualification to operate serial interfaces and their respective communications protocols.

1.1 SAFETY NOTICES IN THE MANUAL

The following Safety Notices will be used in this Manual:



DANGER!

If the recommended Safety Instructions are not strictly observed, this can lead to serious or fatal injuries or equipment damage.



ATTENTION!

Failure to observe the recommended Safety Procedures can lead to material damage.



NOTE!

The purpose of this Manual is to supply important information about the understanding of operation and good performance of the equipment.

1.2 SAFETY NOTICES ON THE PRODUCT

The Following symbols may be attached on the product, giving information about the safety:



High voltage



**Components are sensitive to electrostatic discharge.
Do not touch them**



Mandatory connection to ground protection (PE)



Shielded connection to the ground

1 SAFETY NOTICES

1.3 PRELIMINARY RECOMMENDATIONS



DANGER!

Only qualified personnel should plan or implement the installation, start-up, operation and maintenance of serial interfaces.

Personnel must review the entire Manual of this Soft-Starter before, following carefully all safety notices there indicated.

These personnel must follow all safety instructions included in the Soft-Starter Manual and/or defines by local regulations.

If there is any possibility of personnel injury and equipment damage, that are related to motors driven by motor starters, please install electromechanical safety devices.

In case of use of remote control (via serial communication), consider eventual injuries and damages that can be caused to persons and machines.

Failure to comply with these instruction may result in personnel injury and/or equipment damage.



DANGER!

Never open energized equipment.

Always connect the frame of the equipment to the ground (PE) at the suitable connection point.



ATTENTION

The electronic boards have components that are sensitive to electrostatic discharges. You should never touch any of the electrical components or connectors. If you find it necessary to do so, touch before the metallic frame or use a suitable grounded metallic bracelet.



NOTE!

Communications networks are generally sensitive to interferences generated by other equipment. In order to reduce this interference, adopt all recommended measures.

2.1 ABOUT THIS MANUAL

This Manual describes the installation, start-up, operation and fault identification related to the serial interface of WEG Soft-Starters.

For more details, training and servicing, please contact:

Servicing:

WEG AUTOMAÇÃO
 Tel. (0800) 475767
 Fax: (047) 372-4020



NOTE!

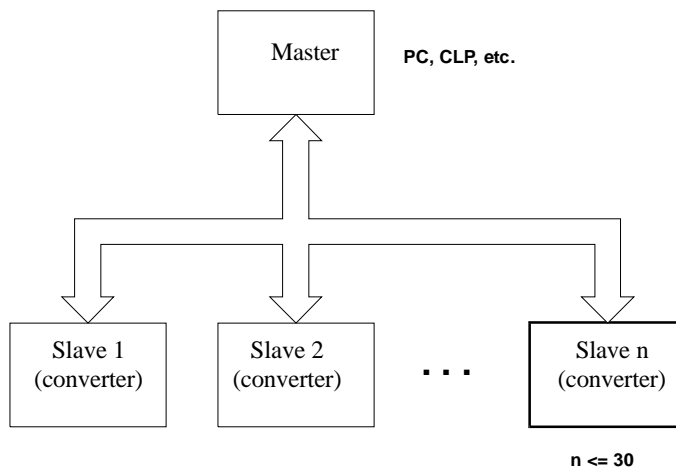
For request of information or servicing, please provide always de following information:

- ⌋ Type of WEG equipment;
- ⌋ Serial number and manufacturing date indicated on WEG equipment nameplate;

Software version that is installed in WEG equipment.

2.2 ABOUT WEG PROTOCOL

The main purpose of the serial network communication is the physical connection of several equipment to one or more masters that so will control though one or two wire pairs all equipment that are connected do this network:



WEG Soft-Starters have a Software to control data transmission and reception though the serial interface, thus enabling the reception of data sent by the master and the transmission of data requested by it.

2 INTRODUCTION

The baud rate is 9.600Bps and it used an exchange protocol of enquiry/answer type that meet standard ISO 1745 for code data transmission.

The mater can perform the following operations related to each WEG equipment that is connected to the network:

⌋ Identifications:

- Network number;
- Soft-Starter type;
- Software version.

⌋ Controls:

- General enabling/disabling;
- Error Reset.

⌋ Status Recognition:

- Enabling / Disabling;
- Acceleration;
- Current limitation;
- Full voltage;
- Energy saving;
- Deceleration;
- Error.

⌋ Parameter reading or changing.

Typical examples of WEG network use

- Monitoring at the same time several variables of WEG Soft-Starters;
- PLC controlling the operation of several WEG Soft-Starters in an industrial process.



NOTE!

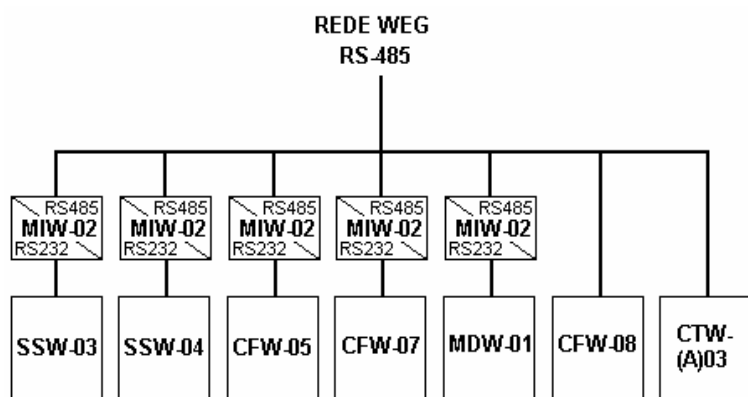
WEG protocol is the same for all WEG equipment, but the words for the logic command, basic variables, as well as parameters can differ from one equipment to other.

The physical connection between WEG Soft-Starter WEG is performed according to one of the standards below:

- ⌋ RS-232 (point-to-point, up to 10m);
- ⌋ RS-485 (multipoint, with the use of the MIW-02 serial interface module, with galvanic isolation, up to 1000m.

3.1 RS-485 INTERFACE

For the serial communication of the Soft-Starter at WEG network.



- ⌋ This interface allows the connections up to 30 WEG Soft-Starters to a Master, attributing to each WEG equipment and address (1 to 30) that must be set at each one.
- ⌋ In addition to these 30 addresses, there are two other addresses to perform special tasks:
 - Address 0: any WEG Soft-Starter connected to the network is required, independently of its address. Only one Soft-Starter can be connected to network (point-to-point) in order to prevent short-circuits in the line interface.
 - Address 31: a control can be transmitted to all WEG Soft-starters in the network simultaneously, without acceptance recognition.

3 COMMUNICATION INTERFACES

↳ List of addresses and corresponding ASCII characters:

Address	ASCII		Address	ASCII
0	@		16	P
1	A		17	Q
2	B		18	R
3	C		19	S
4	D		20	T
5	E		21	U
6	F		22	V
7	G		23	W
8	H		24	X
9	I		25	Y
10	J		26	Z
11	K		27	[
12	L		28	\
13	M		29]
14	N		30	^
15	O		31	_

↳ The connection between the network participants is performed through a pair of wires.

↳ The signal levels are according to EIA STANDARD RS-485 with differential receivers and transmitters.



NOTE!

WEG Soft-Starters SSW-03 and SSW-04 have only serial interface RS-232. Thus you must use the module of the serial interface MIW-02 when a serial interface RS-485 is required.

Module	WEG Item No.
MIW-02	417100543

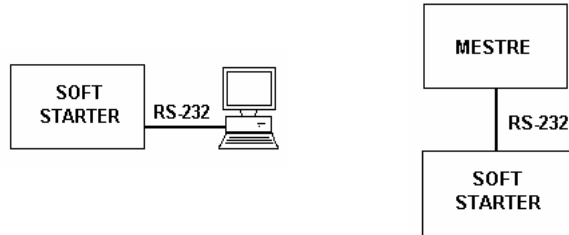


NOTE!

When the Master is fitted with only serial interface - standard RS-232, you must use serial interface module MIW-02, RS-232/RS-485, if it has the RTS signal, Request To Send. If the RTS signal is not available on the Master, you must use a module that can generate the RTS signal.

For more details, please contact WEG.

3.2 RS-232 INTERFACE For communication with WEG Soft-Starters (point-to-point).



- ⌋ In this case we have the connection of a Master to a WEG Soft-Starter.
- ⌋ The logical levels meet EIA STANDARD RS-232C that requires the use of balanced signals.
- ⌋ For RS-232 is used one communication cable.

3.2.1 Electrical Characteristics of RS-232

- ⌋ **RS-232:**
 - **Standard:** EIA Standard RS-232C.
 - **Transmission speed:** 9.600Bps.
 - **Max. cable length:** 10 metros.
- ⌋ **Receiver:**
 - Max. input voltage: $\pm 30V$;
 - Input resistance: $> 3K\Omega$
 - Level 1 (MARK): $< -3V$;
 - Level 0 (SPACE): $> +3V$.
- ⌋ **Transmitter:**
 - Current limitation: $\sim 10mA$;
 - Output voltage – level 1: $< -7V$ ($RL = 3K$);
 - Output voltage – level 0: $> +7V$ ($RL = 3K$).

3.2.2 Cares with the RS-232

- ⌋ Note please that this interface is not isolated against the internal electronics from the equipment to which is connected.
- ⌋ Take care with the wiring location, by separating them at least a distance of 10 cm from the power and control wiring.
- ⌋ It is also a good practice to install the Master as near as possible to the Serial interface RS-232 of WEG Soft-Starter.

3 COMMUNICATION INTERFACES

3.2.3 RS-232 Connection

- ⊖ This interface must be connected point-to-point directly.
- ⊖ There are two standard WEG cables as described below.

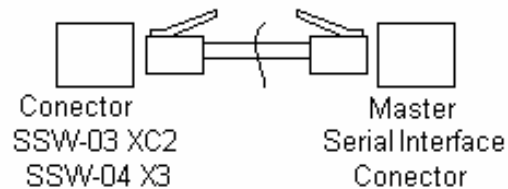
3.2.4 Description of the Serial communication of the Soft-Starter

- ⊖ Connector of the SSW-03 (XC2) and SSW-04 (X3) for the RS-232.

TERMINAL	SYMBOL	DESCRIPTION
1	+5V	+5V ±5%
2	RTS	Request To Send
3	GND	0V
4	Rx	Data reception
5	GND	0V
6	Tx	Data Transmission

3.2.5 Definition of the cable for the RS-232

- ⊖ The cable that must be used is the standard cable for WEG serial communication, equipment x serial HMI of WEG inverters (Human Machine Interface).



Length	WEG Item-No.
Serial cable RS-232 with 0.17m	0307.4790
Serial cable RS-232 with 0.23m	0307.4803
Serial cable RS-232 with 0.32m	0307.4811
Serial cable RS-232 with 1m	0307.4820
Serial cable RS-232 with 2m	0307.4838
Serial cable RS-232 with 3m	0307.4846

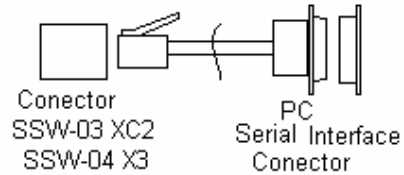
3.2.6 Description of the Master Connector (RJ)

- ⊖ Master connector with RJ.

TERMINAL	SYMBOL	DESCRIPTION
1	Rx	Data reception
2	GND	0V
3	Tx	Data transmission
4	GND	0V
5	nc	Free
6	nc	Free

3.2.7 Definition of the Cable for RS-232 PC

- The cable that must be used is the standard cable for WEG serial communication, equipment x PC.
- It must be connected directly to the PC serial interface.



Length	WEG Item-No.
Serial Cable RS-232 PC with 3m	0307.5460

3.2.8 Description of the PC connector (DB9)

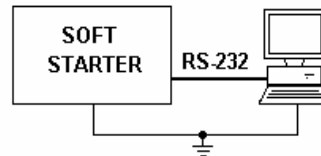
- Serial connector of the PC (DB9).

TERMINAL	SYMBOL	DESCRIPTION
1		Free
2		Data reception
3		Data transmission
4		Free
5		0V
6		Free
7		Free
8		Free
9		Free



NOTE!

Avoid to connect equipment to different grounds, since there can be voltage differences between them and when connected by their interfaces, this voltage difference can damage the equipment.



ATTENTION!

Do not use the neutral conductor for grounding purpose. Use always serial interfaces in RS-485 for long distances.

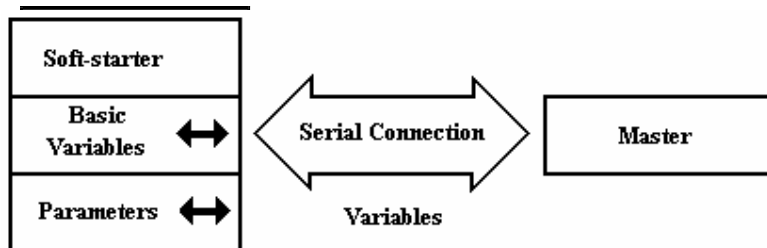
4 DEFINITIONS

4.1 USED TERMS

The protocol used for the serial communication between WEG equipment.

- ⊖ Parameters: are those existing in WEG equipment whose visualization or alteration is possible through the HMI interface;
- ⊖ Variables: are values that have specific functions in WEG equipment and that can be read, and in some cases, modified by the master;
- ⊖ Basic Variables: are those that can be accessed only through the serial interface.

4.2 BLOCK DIAGRAM



4.3 MAGNITUDE STANDARDIZATION

The variable change is subject to the following standardization.

Table of values and function of the parameter content of the Software version **V4.XX** for implementation of: changes, monitoring and control through the serial communication.

Parameter	Parameter Function	Internal value range	HMI Indication
P00	It allows to change the parameters via parallel HMI	0 , 1	0 = oFF 1 = on
P01	Initial starting voltage	25 ... 90 (% Un)	
P02	Ramp time for voltage increment	1 ... 240 (s)	
P03	Voltage step during deceleration	100 ... 40 (% Un)	
P04	Ramp time during voltage decrement	1 , 2 ... 240 (s)	1 = oFF
P11	Current limitation during starting	149 , 150 ... 500 (% Un)	149 = oFF
P12	Protection against immediate overcurrent	32 ... 200 (% In)	
P13	Actuation time of the protection against immediate overcurrent	0 , 1 ... 20 (s)	0 = oFF
P14	Protection against immediate undercurrent	20 ... 190 (% In)	
P15	Actuation time of the protection against immediate undercurrent	0 , 1 ... 200 (s)	0 = oFF
P21	Motor current setting at % of the In of the switch	49 , 50 ... 200 (% In)	49 = oFF
P22	Rated current of the SSW -04 switch	0 ... 4	0 = 16 A 1 = 30 A 2 = 45 A 3 = 60 A 4 = 85 A

DEFINITIONS 4

	Rated current of the SSW -03 switch	0 ... 8	0 = 120 A 1 = 170 A 2 = 205 A 3 = 255 A 4 = 290 A 5 = 340 A 6 = 410 A 7 = 475 A 8 = 580 A 9 = 670 A 10 = 800 A 11 = 950 A 12 = 1100 A 13 = 1400 A
P23	Rated voltage of the power supply network	0 ... 9	0 = 220 V 1 = 230 V 2 = 240 V 3 = 380 V 4 = 400 V 5 = 415 V 6 = 440 V 7 = 460 V 8 = 480 V 9 = 575 V
P24	Analog input gain of the switch current	1 ... 999	X /100 = X,XX
P25	Thermal class of the motor protection	0 ... 5	0 = 5 1 = 10 2 = 15 3 = 20 4 = 25 5 = 30
P26	Motor service factor	80 ... 150	X /100 = X,XX
P27	Self-reset of the thermal memory	0, 1 ... 600	0 = oFF
P28	Operation mode (available only in the SSW -03)	0, 1	0 = oFF 1 = on
P31	Phase sequence	0, 1	0 = oFF 1 = on
P33	Jog voltage level	25 ... 50 (% Un)	
P34	DC braking time	0, 1 ... 10 (s)	0 = oFF
P35	Voltage level of the DC braking	30 ... 50 (% Un)	
P41	Pulse time of the starting voltage	1, 2 ... 20	1 = oFF 2 /10 = 0,2 s
P42	Pulse level of the starting voltage	70 ... 90 (% Un)	
P43	By-pass relay enabling	0, 1	0 = oFF 1 = on
P44	Energy saver enabling	0, 1	0 = oFF 1 = on
P45	Pump Control	0, 1	0 = oFF 1 = on
P46	Parameters for Factory Setting	0, 1	0 = oFF 1 = on
P47	Auto reset	9, 10 ... 600	9 = oFF
P50	Fault relay output RL3	1, 2	1 = disables with error 2 = enables with error

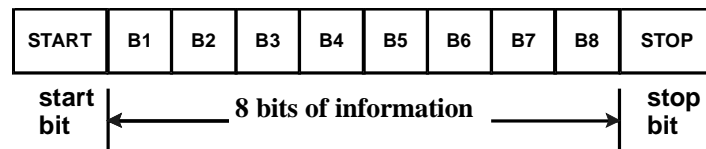
4 DEFINITIONS

P51	Programmable relay output RL1	1 ... 3	1 = in operation
			2 = full voltage
			3 = direct.of rot.
P52	Programmable relay output RL2	1 ... 3	1 = in operation
			2 = full voltage
			3 = DC braking
P53	Programmable digital input 2	0 , 1 ... 3	0 = oFF
			1 = error reset
			2 = external error
			3 =gen. enabling
			4 = three wire communication
P54	Programmable digital input 3	0 , 1 ... 4	0 = oFF
			1 = error reset
			2 = external error
			3 =gen. enabling
			4 = direct.of rot.
P55	Programmable digital input 4	0 , 1 ... 4	0 = oFF
			1 = error reset
			2 = external error
			3 =gen. enabling
			4 = Jog function
P56	Programmable analog output (available only in SSW-03)	0 , 1 ... 4	0 = oFF
			1 = current (%)
			2 = voltage (%)
			3 = cos u
			4 = therm. status
P57	Analog output gain ((available only in SSW-03)	1 ... 999	X /100 = X,XX
P61	Start / Stop enabling via HMI or serial com.	0 , 1	0 = oFF
			1 = on
P62	Switch address in the communication network	1 ... 30	
P63	Verification time of the serial communication	0 , 1 ... 5 (s)	
P64	Verification action of the serial communication	1 ... 3	1 = only E29
			2 = ramp disabl.
			3 = gen disabling
P71	Indication of the Software version	XXX	XXX /100 = X.XX
P72	Motor current indication (%) of the In of the switch	0 ... 9999 (% In)	
P73	Motor current indication (A)	0 ... 9999 (A)	
P74	Indication the active power supplied to the load (kW)	0 ... 65535	X /10 = X, X kW
P75	Indication of the Apparent power supplied to the load (kVA)	0 ... 65535	X /10 = X, X kVA
P76	Indication of the cos φ of the load	0 .. 99	X /10 = X,X
P77	Indication of the voltage applied by the switch (% Un)	0 ... 100 (% Un)	
P81	Temperature of the heat sinker (available only in the SSW-04)	0 ... 130 (°C)	
P82	Status indication of the thermal protection of the motor	0 ... 250	250 = error
P96	Back-up of the last activated Hardware error	1 ... 8	
P97	Back-up of the penultimate activated Hardware error	1 ... 8	
P98	Back-up of the last but two activated Hardware	1 ... 8	
P99	Back-up of the first of the four last activated errors	1 ... 8	

4.4 CHARACTER FORMAT

- ⌋ 1 start bit;
- ⌋ 8 information bits [codify the text character and the transmission character, taken from the 7 bit code, according to ISO 646 and supplemented to even parity (eighth bit)];
- ⌋ 1 stop bit;

After the start bit follows the less significant bit:



4.5 PROTOCOL

The transfer protocol meets ISO 1745 requirements for the code data transfer.

Are used only text character sequences without header.

The error monitoring is realized by means of the transmission related the parity of the individual 7 bit characters, according to ISO 646.

The parity monitoring is realized according to DIN 66219 (even parity). Two types of messages are used (by the Master):

- ⌋ **READING TELEGRAM:** to enquiry the variable content of the starting switch
- ⌋ **WRITING TELEGRAM:** to change the variable content or to sent commands to the starting switch.

Note.: Transmission between two inverters is not possible.

The master has the access control to the bus bar.

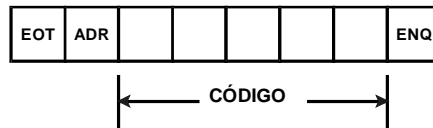
4.5.1 Reading Telegram

This telegram allows that the master receives from the Soft-Starter the content corresponding to the enquiry code.

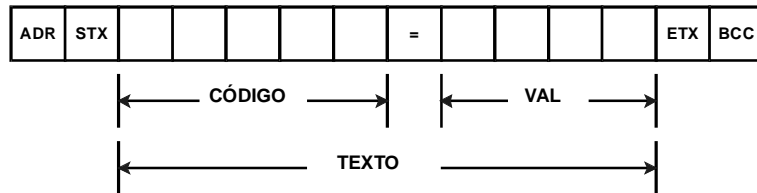
In the answer telegram, the Soft-Starter transmits the data requested by the master and the it completes the transmission with EOT.

4 DEFINITIONS

1) Mestre:



2) Soft Starter:



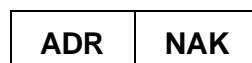
⌋ Reading telegram format:

- **EOT**: control character **End Of Transmission**;
- **ADR**: inverter address (ASCII@, A, B, C, ...) (ADResS);
- **CÓDIGO**: address of the 5 digit variable codified in ASCII;
- **ENQ**: **ENQUIRY** control character;

⌋ Format of the answer telegram of the Soft-Starter:

- **ADR**: 1 character – Soft-Starter address;
- **STX**: control character - **Start of TeXt**;
- **TEXTO**: consists in:
- **CÓDIGO**: variable address;
- " = ": separation character;
- **VAL**: 4 digit value **HEXADECIMAL**;
- **ETX**: control character - **End of TeXt**;
- **BCC**: **Byte of CheCksum** - **EXCLUSIVE OR** of all bytes between STX (excluded) and ETX (included).

Note: In some cases the switch answer can be given with:

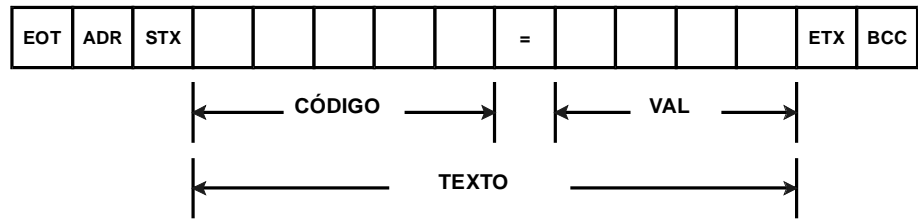


4.5.2 Writing Telegram

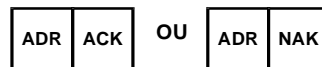
This telegram sends data to the variables of the starting switch.

The switch will answer by indicating if the data were receipt or not.

1) Mestre:



2) Soft Starter:



⌋ Writing telegram format:

- **EOT:** control character **End Of Transmission**;
- **ADR:** address of the Soft-Starter;
- **STX:** control character **Start of TeXt**;

TEXTO: consists in:

- **CÓDIGO:** address of the variable;
- **" = ":** separation character;
- **VAL:** value if formed by 4 digits **HEXADECIMAL**;
- **ETX:** control character **End of TeXt**;
- **BCC:** **Byte of CheCksum - EXCLUSIVE OR** of all bytes between STX (excluded) and ETX (included).

⌋ Format of the answer telegram of the Soft-Starter:

Accepting:

- **ADR:** Soft-Starter address;
- **ACK:** control character **ACK**nowledge;

Non accepting:

- **ADR:** Soft-Starter address;
- **NAK:** control character **Not AcK**nowledge.

This means that the data were not accepted and that the addressed variable retains its old value.

4.6 EXECUTION AND TEST TELEGRAM

The Soft-Starters and the master test the telegram syntax.

Below are defined the answers for the respective verified condition:

⌋ **Reading Telegram:**

- Without answer: with wrong telegram structure, control characters were wrongly received, or the Soft-Starter was wrong;

4 DEFINITIONS

- NAK: CODE corresponding to an inexisting variable or read-only variable;
- TEXTO: with valid telegrams.

⌋ **Writing Telegram:**

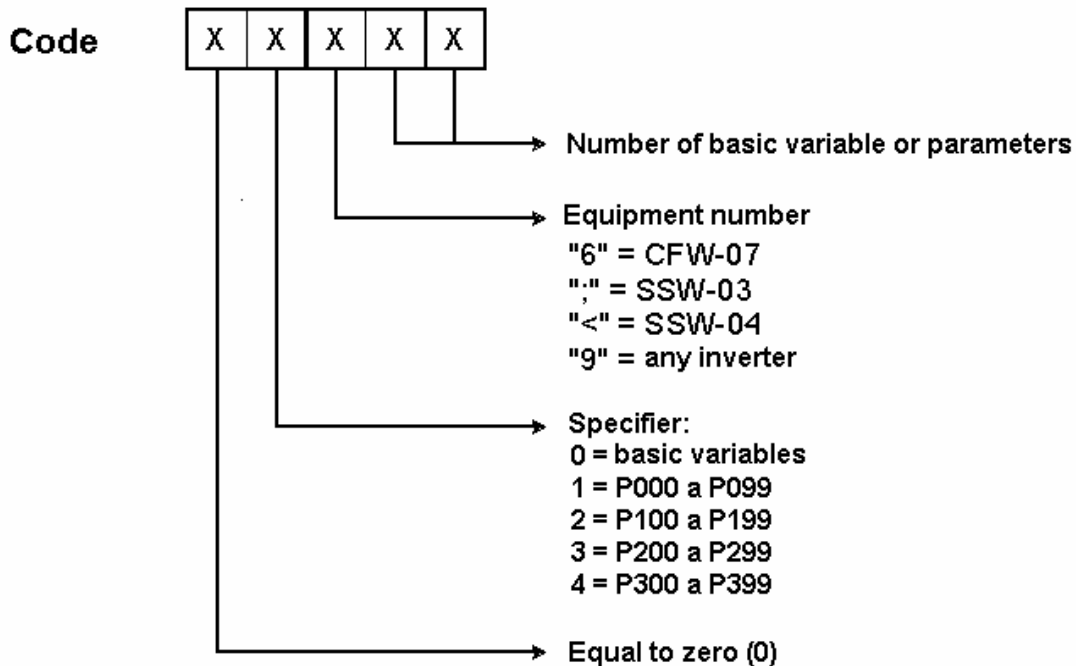
- Without answer: with wrong telegram structure, received control characters are wrong or Soft-Starter address is wrong;
- NAK: with code corresponding to an inexisting variable, wrong BCC (Byte of CheckSum), read-only variable, VAL outside the permitted range for the variable at issue, operation parameter outside the changing mode.
- ACK: with valid telegrams;

4.7 TELEGRAM SEQUENCE

The telegram is processed in the Soft-Starters at determined time intervals. Thus, between two telegrams for the same Soft-Starter it must be assured a pause longer than the time sum of the involved telegrams. (see Item 4.9).

4.8 VARIABLE CODE

The filed designated by CODE contains the parameter address and the basic variables formed by 5 digits (ASCII Characters), as follows:



4.9 TIMES

⌋ The baud rate of the serial communication of WEG Soft-Starters WEG is 9600bps.

⌋ Times of WEG protocol:

Baud rate of data reception / transmission: 9600bps	1bit / 104,2us
Each data word has 10bits	1,04ms
One enquiry telegram has 8 words	8,33ms
One answer telegram to an enquiry has 14 words	14,58ms
One changing telegram has 15 words	15,63ms
One answer telegram to a changing has 2 words	2,08ms
One updating of a requested variable (with immediate answer)	22,91ms
One changing of a written variable (with immediate answer)	17,71ms



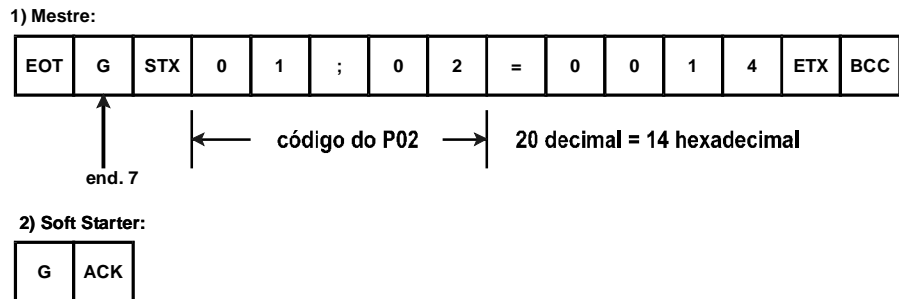
NOTE!

The master should maintain between two variable transmissions to the same Soft-Starter, a wait time compatible with the telegram types to be processed and their respective answers.

5 TELEGRAM EXAMPLES

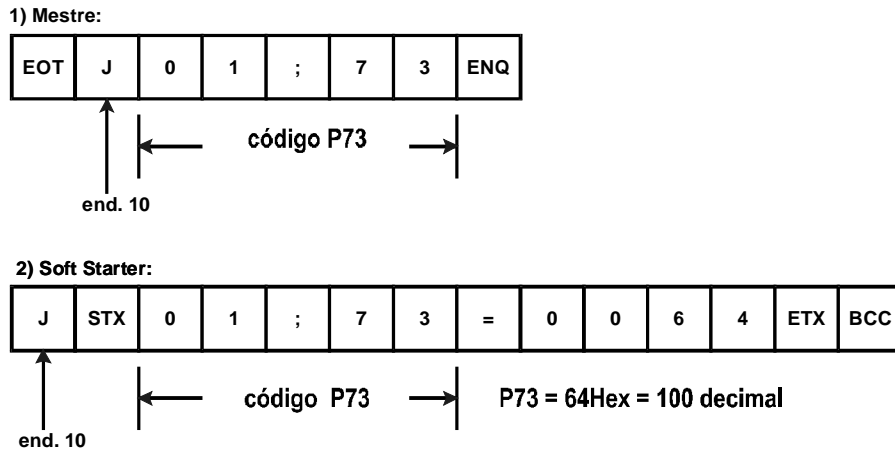
5.1 EXAMPLE 1

↳ Starting time change(P02) to 20s in the Soft-Starter 7 (“;” = SSW-03).



5.2 EXAMPLE 2

↳ Reading of the inverter output current 10, presuming it was 100A at the enquiry moment. (“;” = SSW-03).



NOTE!

The examples above presume that the used Soft-Starter is a SSW-03. When a SSW-04 is used, the value “;” of the code should be changed to “<”.

6.1 BASIC VARIABLES

6.1.1 V00 (code 00x00)

- ⌐ Indication of the equipment type.
- ⌐ Reading variable;

6.1.2 V01 (code 00x01)

- ⌐ Indication of the Soft-Starter status.

Reading variable, which bits have the following meaning:

LSB

0	0 = disabled	1 = enabled
1	0 = general disabling	1 = general enabling
2	0 = free	1 = in jog
3	0 = free	1 = In acceleration
4	0 = free	1 = in current limiting
5	0 = free	1 = at full voltage
6	0 = free	1 = in energy saver
7	0 = free	1 = in deceleration
8	reserved	
9	0 = free	1 = in DC braking
10	0 = free	1 = In changing the direction of rotation
11	0 = clockwise	1 = Counter-clockwise
12	reserved	
13	0 = free	1 = with hardware error
14	0 = without power supply	1 = with power supply
15	0 = without error	1 = with error

MSB

6.1.3 V02 (code 00;02)

- ⌐ Indication of the Soft-Starter error.
- ⌐ Reading variable which bits have the following meaning:
Serial Error (byte-high)
Hardware Error (byte-low)

Errors:

Serial Error								Hardware Error							
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

MSB

LSB

6 VARIABLES OF THE SERIAL COMMUNICATION

Error code: error number in hexadecimal

Ex.: E00 Ü00H
E01 Ü01H
E10 Ü0AH

6.1.4 V03

(code 00;03)

- ⊖ Selection of the logic control.
- ⊖ Writing variables, which bits have the following meaning::

MSB		
0	0 = Disables	1 = enables
1	0 = General enabling	1 = General disabling
2	0 = Without jog	1 = com jog
3	0 = Clockwise	1 = Counter-clockwise
4	Reserved	
5	Reserved	
6	Reserved	
7	0 = free	1 = resetting
8	1 = Enabling/disabling	
9	1 = General enabling/disabling	
10	1 = jog	
11	1 = clockwise	
12	reserved	
13	reserved	
14	reserved	
15	1 = Switch " reset " when error occurs	

MSB

- ⊖ **BYTE HIGH (8-15):** desired action mask. The corresponding bit should be set to 1 to enable this action.
- ⊖ **BYTE LOW (0-7):** logic level of the desired action.



NOTE!

The reset acts only when the Soft-Starter has hardware error.



NOTE!

To use the Jog control and the reversal of the direction of rotation via serial communication, you must set the following parameters: P54=4, P55=4 and P61=on.

7.1 PARAMETERS RELATED TO THE SERIAL COMMUNICATION

- ⌋ P61 – Controls via HMI and Serial or via Digital Inputs.
- ⌋ P62 – Switch address on the communication network.
- ⌋ P63 – Verification time of the Serial Communication.
- ⌋ P64 – Verification Action of the Serial Communication.

7.2 ERRORS RELATED TO THE SERIAL COMMUNICATION

- ⌋ They do not cause WEG Soft-Starter lockout;
- ⌋ They do not deactivated the fault relay;
- ⌋ The inform only on the display and in the logic status word.

Types of errors:

- **E22:** longitudinal parity error (BCC);
- **E24:** parameter changing attempt can be realized only with stopped motor;
- **E25:** inexistent variable;
- **E26:** desired value outside the permitted limits;
- **E27:** writing attempt on read-only variable or logic control is disabled;
- **E29:** cyclic serial communication error interrupted.

Note:

These errors can be observed through the reading if the status variable of WEG equipment.

NOTE!



Error E29 may lockout the Soft-Starters. This protection is used in installations where the Soft-Starter has to take a decision when a communication fault occurs between the master and the Soft-Starter.

NOTE!



Please take care with the parameter compatibility. For more details about parameter incompatibilities, see please Manual of WEG Soft-Starters.

8 FAULTS AND CORRECTIVE ACTIONS

Problems:	Corrective Actions:
No communication with Soft-Starter:	<ul style="list-style-type: none"> ⊐ Check if telegram format is correct. <ul style="list-style-type: none"> • Equipment Code; • Byte of BCC is correct; • Parity; • Word length. ⊐ Check all cable connections of the serial communication and check if power supply of all connected equipment is correct. ⊐ Check if the baud rate of the master is 9600bps. ⊐ Check if the Soft-Starter address (P62) is the same to which the master is sending the telegrams. ⊐ When a RS-485 is used and the master is using RS-232/RS-485 inverter, check if there is present a RTS signal.
Master reads but does not change the Soft-Starter parameters:	<ul style="list-style-type: none"> ⊐ Check if the format of the changing telegrams is correct. ⊐ Check if there is no writing attempt on a read-only variable. ⊐ Check if this variable can be changed with enabled motor.
Random indications of serial errors in the serial communication:	<ul style="list-style-type: none"> ⊐ When installed in communication network with RS-485: <ul style="list-style-type: none"> • Check all serial communication cables in the network and their shields; • Check if all grounding points are grounded correctly; • Check if only the network terminal points are fitted with termination resistors; ⊐ Check the cables of all RS-232-connections. They should be as short as possible and be laid separately from the serial communication cables.