DOGA®
ASSEMBLY
TECHNOLOGY

BIT SOCKET TRAY
LCD version
4 to 16 slots

INSTRUCTIONS MANUAL

IMPORTANT

The tool delivered with this manual may have been modified for specific needs.
In that case, please give us the tool code number written on our shipping note or the approximate tool delivery date when you place an order for a new similar tool or for spare parts.
In that way, you will be sure to get the required tool and/or spare part.

WARNING
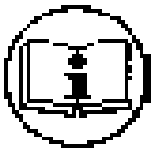
This information has to be kept in a location known by all users.

Each operator has to read carefully this manual before installing, using, and mending the product.

Be sure that the operator has understood using recommendations and the meaning of signs put on the product.

Most accidents could be avoided respecting this Manual Instructions. As a matter of fact, they were created according to European laws and norms regarding products.

In each case, please respect and follow safety national norms. Do not take off nor damage the stickers or advise put on the product and above all the details imposed by the law.

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1. GENERAL SAFETY RULES

ENGLISH

WARNING! Read and understand all instructions. Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury

SAVE THIS INSTRUCTIONS

1.1 Work Area

- **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
- **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
- **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control.

1.2 Electrical Safety

- **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.** If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
- **Avoid body contact with grounded surface ad pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is grounded.
- **Don't expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock
- **Do not abuse the cord. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately.** Damaged cords increase the risk of electric shock.
- **When operating a power tool outside, use an outdoor extension cord marked W-A or W.** These cords are rated for outdoor use and reduce the risk of electric shock.

1.3 Personal Safety

- **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inflation while operating power tools may result in serious personal injury.
- **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
- **Avoid accidental starting. Be sure switch is off before plugging in.** Carrying tools with your finger on the switch or plugging in tools may result in personal injury.

- **Remove adjusting keys or switches before turning the tool on.** A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.
- **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
- **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

1.4 Tool use and Care

- **Use clamps or other practical way to secure and support the workplace to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.
- **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
- **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety
- **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
- **Maintain tools with care**. **Keep cutting tools sharp and clean.** Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.
- **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.
- **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool, may become hazardous when used on another tool.

1.5 SERVICE

- **Tool service must be performed only by qualified personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury
- **When servicing a tool, use only identical replacement parts. Follow instructions in**
- **the Maintenance section of this manual.** Use of unauthorized parts or failure to follow Maintenance instructions may create a risk of electric shock or injury.

2. SPECIFIC SAFETY RULES

2.1 Hold tool by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring or its own cord. Contact with a "live" wire will make exposed metal parts of the tool "live" and shock the operator.

2.2 Never lubricate aerosol oil on to the electrical part.

2. Model

BST-x LCD (x = 4, 8, 12, 16)   x = number of bit/sockets

3. Specifications

Number of bit/sockets	4, 8, 12 or 16 sockets with sensors (modification available)
Type of sensors	Magnet inductive sensor, 24V, 3-wire, PNP or NPN
Connection of sensors	Terminal block with fast connection (push/release type)
Number of LED	4, 8, 12, 16 selection lamps, power lamp, alarm lamp, operation lamp
Connection of Lamps	24V, 2-wire terminal block with fast connection
Display	1.29'' Amoled color display
Input power	24VDC, 1A –included power adaptor 230V 50/60Hz
Number of sensor modification	Setting on display
Hole size of bit holder	<u>Bit holder are not included (sold separately)</u> Different models : full to be drilled, or drilled with hole size : 3mm, 7,5mm, 10mm, 15mm, 18mm
I/O	25Pin D-Sub female connector 8 Inputs for indicating 8 sockets (binary) 8 Outputs for selecting preset # (binary) 24V DC power output (Max 0.5A)
Com port	2xRS422(for Modbus RTU serial communication)

4. Layout of standard packing

RS422 port - DIP*   25P I/O   Power 24VDC

*DIP : Termination resistance
ON at the end when RS422

Display
(Setting and informations)

LED
(Bit Selection)

Bit holder are not included (sold separately)

To dismount bit holder untight the 2 screws of 5 turns to release the internal lock rail (internal flat bar with semicircle form)

24VDC adaptor

CE plug

Bit holder	Ø 18mm	Ø 15mm	Ø 10mm	Ø 7.5mm	3mm Pre-drilled	To be machined

Material : Thermoplastic polyoxymethylene (POM)

5. Operation

5.1 Master mode

A preset # of the MD tool or <u>other tool </u> is automatically selected by the I/O when the bit is selected on the bit socket tray.

When one bit is selected, the corresponding output signals are provided to the tool controller in order to select the preset #.

Otherwise the socket tray will provide the tool disable

```
          ╭──────────────────╮
          │   Master mode    │
          ╰──────────────────╯
                   │
                  Yes
                   │
                   ▼
              ◇ Number of ◇
              ◇ active socket ◇ ──No──▶  ┌─────────────────────────┐
              ◇ sensors ≤ 1 ◇            │ 1) BIT alarm message    │
                   │                     │ 2) Tool disable output  │
                  Yes                    │ 3) Selection output signal│
                   │                     └─────────────────────────┘
                   ▼
   ┌──────────────────────────────────────────────────┐
   │ 1) Indicating  LED is continuously turned ON.     │
   │ 2) Provide the output signal of the selected      │
   │    socket position for preset# selection          │
   └──────────────────────────────────────────────────┘
```
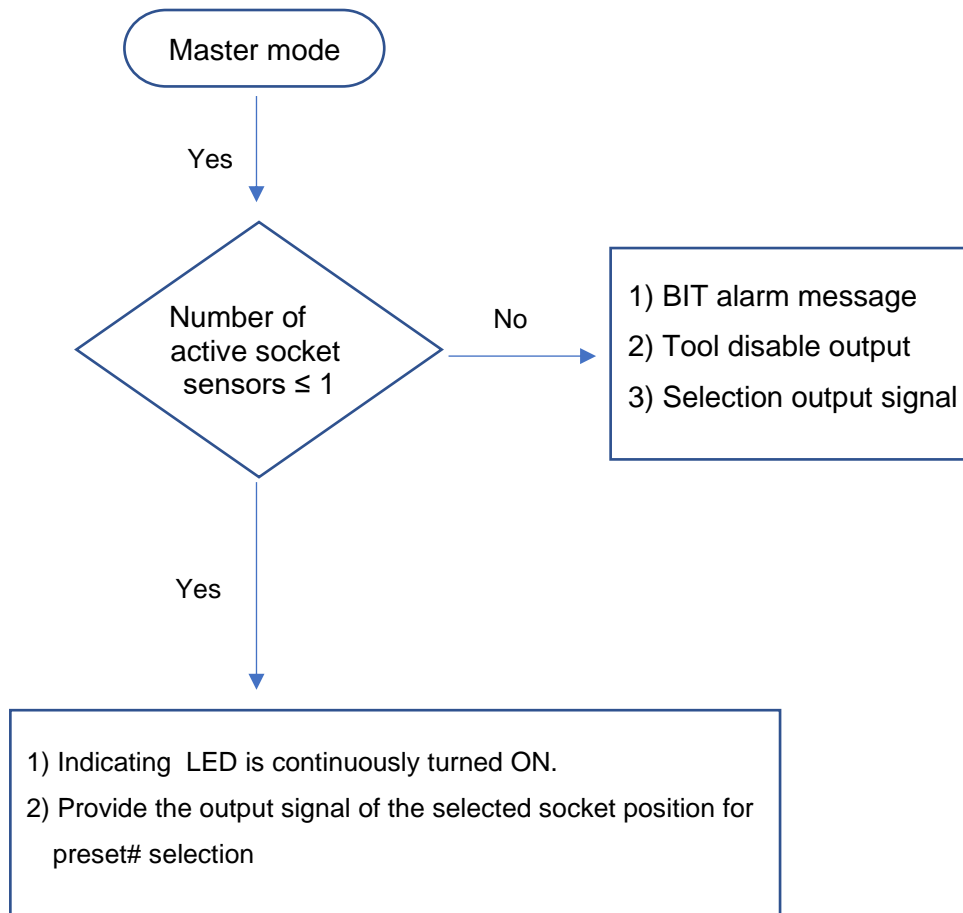
5.2 Slave mode

MD or other device that provide the output signal of preset program no. or torque setting no. can guide operator to select one of the 8 or 16 sockets through LED lighting. The tool should provide the output signal for the selected preset # to the bit socket tray. The bit socket tray indicate the corresponding LED. When the wrong bit is selected, it provides BIT alarm message and alarm output signal.

```
              ╭─────────────────╮
              │    Slave mode    │
              ╰─────────────────╯
                       │
                       │ Yes
                       ▼
                 ╱─────────────╲              ┌──────────────────────┐
                ╱   Selection    ╲    No       │  Tool disable output  │
                ╲  input received ╱ ──────────▶│                      │
                 ╲───────────────╱             └──────────────────────┘
                       │
                       │ Yes
                       ▼
                 ╱─────────────╲              ┌──────────────────────┐
                ╱ Selection input╲   No        │ - BIT alarm message   │
                ╲  within range  ╱ ──────────▶ │ - Tool disable output │
                 ╲──────────────╱              └──────────────────────┘
                       │
                       │ Yes
                       ▼
               ╱────────────────╲
              ╱  Selection LED    ╱
              ╲  starts blinking ╱
               ╲────────────────╱
                       │
                       │ Yes
                       ▼
                 ╱─────────────╲              ┌────────────────────────────────┐
                ╱ Corresponding  ╲   No        │ - Selection LED keeps blinking  │
                ╲  socket is      ╱ ──────────▶│ - Selected socket LED is turned ON │
                ╲  selected      ╱             │ - Alarm output (tool disable)   │
                 ╲──────────────╱              │ - BIT alarm message             │
                       │                       └────────────────────────────────┘
                       │ Yes
                       ▼
              ┌────────────────────┐
              │ - Corresponding LED │
              │ continuously ON     │
              │ - Selection output  │
              │   signal            │
              └────────────────────┘
```
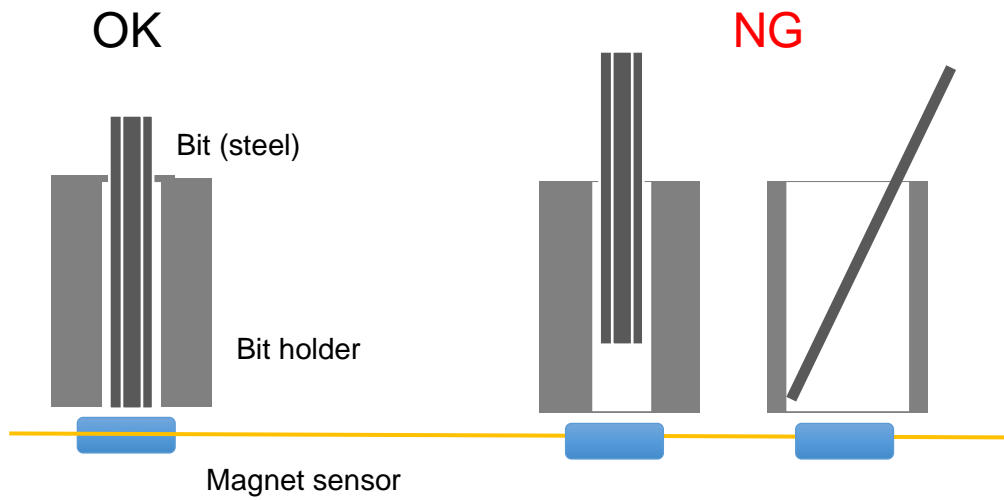
5.3 **Magnet sensor to detect steel bit**

There are sensors at the bottom of the bit holders. The sensor activates with the steel material.
The sensor can not be activated with the too much thin diameter of the bit. And the bit should be located at the closed to the sensor

OK

NG

Bit (steel)

Bit holder

Magnet sensor

6. Settings by Display

6.1 Parameter menu

Key	Name	Description
F1	OPER	Move operation page
F2	SEL	Select parameter
F3	DOWN	Select another parameter
F4	UP	Select another parameter

No.	Name	Description	Value		Factory setting
1	M / S select	Master or Slave mode	Master	Slave	Master
2	Input IO type	Input binary	Binary	Binary +1	Binary +1
3	Output IO type	Output binary	Binary	Binary +1	Binary +1
4	Alarm sound	Beep sound	OFF	On	OFF
5	Para init	Parameter initialize	0 ~ 9999		0
6	Comm ID	Communication ID	0 ~ 9		1
7	Sensor num	Select number of bit socket	1 ~ 16		16
8	Protocol	Communication type	I/O	Serial	I/O
9	Mapping enable	-	OFF	On	OFF
10	Bit mapping	-	0 ~ 16		0
11	LCD off time	-	0 ~ 60 (min)		10
12	Password	-	0000 ~ 9999		0000
13	Preset output	Preset output signal enable	OFF	On	On

6.2   Operation menu

Key	Name	Description
F1	SET	Move to parameter page
F2	PARA	Main settings display
F3		
F4	BIT	Bit mapping display

6.3   Parameter display(summary) :

[F1] : main settings

[F4] : with bit mapping

[F4] : without bit mapping

or

6.3.1 M/S select

Select the mode of the bit socket tray among Master / Slave mode
(mode description in chap 5.1 and 5.2).

Master (bit tray is Master) :
When one bit is selected on the bit socket tray, it select
automatically a preset through BST outputs
Bit mapping setting will convert Bit selected to a Preset

Slave (bit tray is Slave) :
A controller or other device will select a Preset on BST inputs
Bit mapping setting will convert Preset to Bit to be used

6.3.2 Input IO type

Used with Slave mode : for bit selection

Binary Input type for IO

- Input+0 = standard binary coding
- Input+1 = binary coding incremented +1

It is described in
[7.3 SLAVE mode - Bit socket tray I/O pins coding].

6.3.3 Output IO type

Used with Master mode : for program selection

Binary Output type for IO

- Output+0 = standard binary coding
- Output+1 = binary coding incremented +1

It is described in
[7.2 MASTER mode - Bit socket tray I/O pins coding].

6.3.4 Alarm sound

Control the sound of alarm : ON / OFF

6.3.5 Parameter initialize

Parameters can be return to the factory setting.
If you set the value 77, the parameter is initialized.

Selected digit

[F2] SHIF : to select value digit

6.3.6 Comm ID

It is used when communicating in RS422 with protocol.

When communicating with multiple bit socket trays, the values should be different.

6.3.7 Sensor num (Select number of socket)

Select number of sockets to be used.

Always starting from the first bit holder and contiguous positions.

Bit holder not used can remain empty

6.3.8 Protocol

Set communication between controller and bit tray

I/O : no protocol selection through digital IO's – can be used in master or slave mode

Serial : Modbus communication through RS422 – only available in slave mode

6.3.9 Mapping enable

Bit mapping: OFF - Direct single matching

[Master mode]

Bit	Preset (outputs)
#1	#1
#2	#2
#3	#3

[Slave mode]

Preset (inputs)	Bit
#1	#1
#2	#2
#3	#3

Bit mapping: ON.
Set custom mapping in master or slave (set up in next parameter)

6.3.10 Bit mapping

Assignment of Socket no. and screwdriver Preset # can be 1:1 direct single matching connection or flexible multiple matching connection as below examples.

Ex)
[Master mode] a preset can be used with several bits

[Slave mode]   Use one bit in multiple presets.

6.3.11 LCD off time

This is a function to change the LCD screen to power saving mode.

The LCD screen turn off when the key button is not used for a certain period.

The minimum setting unit is minutes.

If the value is set to 0, the power saving mode operation is disabled.

6.3.12 Password

This password is used to enter the parameter setting window
-        The initial password is "0 0 0 0".
-        After setting the password, press the "SET" key.
-        Password O → Parameter setting window
-        Password X → Operation window

If you lose your password, it will be initialized if you press the F4 key more than 30 times in the [SETTING] screen.

6.3.13 Preset output

Controls the preset output signal.

In Slave mode,
-        Turn OFF when you do not need preset output signal
-        Turn ON when you need preset 'echo' on outputs

In Master mode, it should always be set to ON.

7. Serial communication

7.1 Settings and Connection

Instead of screwdriver preset # section, RS422 serial communication is also available to select screwdriver preset #.
Communication baud rate is 115200 bps.
No.6 Comm ID: 1 ~ 9 (Default 1)
No.8 Protocol: Serial

Comm ID is a number that identifies the bit socket tray during communication.
When different bit socket trays are connected, they must have different numbers. Communication method is described in [7.2 Communication protocol].

[COM cable details]

Use direct LAN cable for RS422 serial communication with following pin configuration.

[Bit socket tray]   [Receiver]
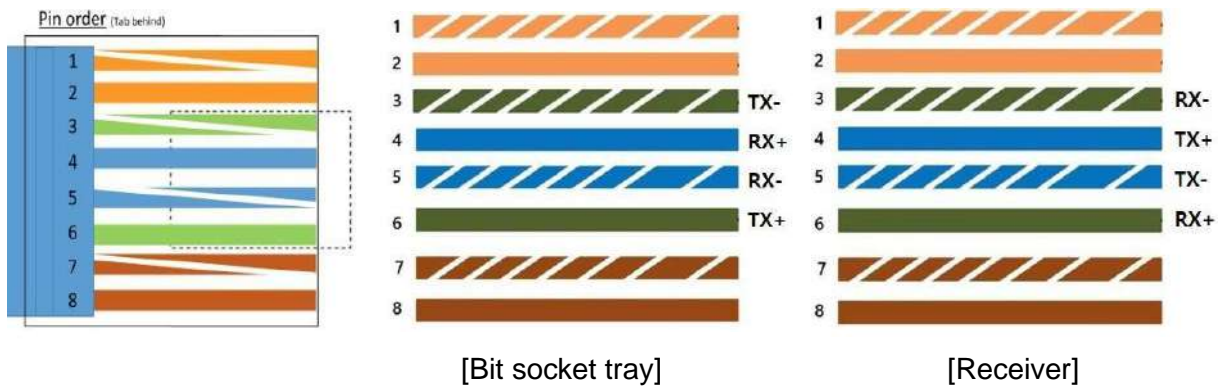
7.2 Communication protocol

Bit socket tray use Modbus-RTU protocol.

If several bit socket trays are connected together, send a message to one bit socket tray and do not send a message until a response is received. (Timeout : 200ms)

7.2.1 Modbus-RTU

Request message

Slave address	Function Code	Address High	Address Low	Data Length High	Data Length Low	CRC(RTU) Low	CRC(RTU) High

1. Slave address: It means comm ID.
2. Function code: It means the kind of command. (4 : read, 6 : write)
3. Address: It means target address. (2byte)
4. Data length: It means the number of data to be read. (2byte)
5. CRC : Error detection

	Slave address	Function Code	Address High	Address Low	Data Length High	Data Length Low	CRC(RTU) Low	CRC(RTU) High
e.g. (Hex)	01	04	0C	80	00	01	33	72

Response message

Slave address	Function Code	Data byte Length	Data High	Data Low	CRC(RTU) Low	CRC(RTU) High

1. Data byte length: Byte number of data
2. Data : value.

	Slave address	Function Code	Data byte Length	Data High	Data Low	CRC(RTU) Low	CRC(RTU) High
e.g.	01	04	02	00	01	78	F0

7.2.2 Address List

Address	Description	Function code	R / W
3200	Select bit	0x06	Write (slave mode)
3200	Read bit	0x04	Read (master mode)
3201	Alarm	0x04	Read only
3202	Master/Slave mode	0x04	Read only
3203	I/O output state (	0x04	Read only
3204	Enabled sensor number	0x04	Read only

7.2.3 Read

Read status of Bit status(Address: 3200), Alarm(Address: 3201), Master/Slave mode(Address: 3202), I/O output state(Address: 3203), Enabled sensor number(Address: 3204).
Use function code: 0x04.

Bit status

Check the status by bit unit of data value.
If data no.1 bit is 0, the bit 1 is not used.
If data no.1 bit is 1, the bit 1 is used.
In case of 0x04(0000 0000 0000 0100) only bit 3 is used.

Request

Slave address	Function Code	Address High	Address Low	Data Length High	Data Length Low	CRC(RTU) Low	CRC(RTU) High
01	04	0C	80	00	01	33	72

Address: 3200, Data length: 1

Response

Slave address	Function Code	Data byte Length	Data High	Data Low	CRC(RTU) Low	CRC(RTU) High
01	04	02	00	01	78	F0

Data: 1 (Bit 1 used)

Alarm

Address is 3201.
No alarm when the value is 0 (Tool available).
Alarm when the value is 1 (Tool unavailable).

Master / Slave mode

Address is 3202.
Slave mode when the value is 0.
Master mode when the value is 1.

I/O output state

Address is 3203.
The transfer value is IO output value. When bit socket tray is master mode, then transmit preset number. When bit socket tray is slave mode, then transmit selected Bit number. It is not related with "Output IO type", "Preset output" parameter. When error occur, it send 0 value.
If use mapping function, it sends changed value by mapping function.

- Request

Slave address	Function Code	Address High	Address Low	Data Length High	Data Length Low	CRC(RTU) Low	CRC(RTU) High
01	04	0C	83	00	01	C3	72

1. Address: 3203, Data length: 1.

- Response

Slave address	Function Code	Data byte Length	Data High	Data Low	CRC(RTU) Low	CRC(RTU) High
01	04	02	00	03	F9	31

1. Data: 3 (Preset 3 selected.)

Enabled sensor number

Address is 3204.
"Enabled sensor number" inform how many sensors are active.

7.2.4 Write

Selecting Bit is set to communication, not IO.
It can only Slave mode, Protocol: Serial.
Function code: 0x06, Address: 3200.
Data value indicates the bit to be used. (Data: 8 → Bit 8)

Request

Slave address	Function Code	Address High	Address Low	Data High	Data Low	CRC(RTU) Low	CRC(RTU) High
01	06	0C	80	00	01	33	72

Bit 1 is activated.

Response

Slave address	Function Code	Address High	Address Low	Data High	Data Low	CRC(RTU) Low	CRC(RTU) High
01	06	0C	80	00	01	33	72

When the request is applied, the same message is returned as a response.

7.2.5 Error Message

Occurs when the requested message is anormal during communication.
(If the data is out of range. If CRC is not correct)
In response, 0x80 is added to the requested function code.

Error code list

Error	Function code	Address	CRC	Data range
Code	01	02	07	0E

Example

Request

Slave address	Function Code	Address High	Address Low	Data High	Data Low	CRC(RTU) Low	CRC(RTU) High
01	06	0C	80	00	01	33	00

CRC is wrong.

Response

Slave address	Function Code	Error code
01	86	07

0x80 is added to the requested function code.
CRC error

8. Inputs/Outputs

8.1 I/O details

Connector : 25P D-sub female socket

Pin No	Binary, Binary+1
1	In1
2	In2
3	In3
4	In4
5	X
6	X
7	X
8	X
9	Out1
10	Out2
11	Out3
12	Out4
13	X
14	X
15	X
16	X
17	X
18	Tool Enable
19	Alarm (Tool Disable) -used by Doga tools
20	GND
21	24V
23	COM IN
24	COM OUT

Remark :
PNP wiring (standard cable) : 20(GND) – 24(Out com), 21(24V+) – 23(In com)
NPN wiring : 20(GND) – 23(In com),   21(24V+) –24(Out com)

8.2   MASTER mode - Bit socket tray I/O pins coding

Master Binary coding with 4 pins I/O

Preset #	Out 4	Out 3	Out 2	Out 1
1	0	0	0	0
2	0	0	0	1
3	0	0	1	0
4	0	0	1	1
5	0	1	0	0
6	0	1	0	1
7	0	1	1	0
8	0	1	1	1
9	1	0	0	0
10	1	0	0	1
11	1	0	1	0
12	1	0	1	1
13	1	1	0	0
14	1	1	0	1
15	1	1	1	0

Master Binary +1 coding with 4 pins I/O

Preset #	Out 4	Out 3	Out 2	Out 1
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

8.3 SLAVE mode - Bit socket tray I/O pins coding

Slave Binary coding with 4 pins I/O

Preset #	In / Out 4	In / Out 3	In / Out 2	In / Out 1
1	0 / 0	0 / 0	0 / 0	1 / 1
2	0 / 0	0 / 0	1 / 1	0 / 0
3	0 / 0	0 / 0	1 / 1	1 / 1
4	0 / 0	1 / 1	0 / 0	0 / 0
5	0 / 0	1 / 1	0 / 0	1 / 1
6	0 / 0	1 / 1	1 / 1	0 / 0
7	0 / 0	1 / 1	1 / 1	1 / 1
8	1 / 1	0 / 0	0 / 0	0 / 0
9	1 / 1	0 / 0	0 / 0	1 / 1
10	1 / 1	0 / 0	1 / 1	0 / 0
11	1 / 1	0 / 0	1 / 1	1 / 1
12	1 / 1	1 / 1	0 / 0	0 / 0
13	1 / 1	1 / 1	0 / 0	1 / 1
14	1 / 1	1 / 1	1 / 1	0 / 0
15	1 / 1	1 / 1	1 / 1	1 / 1

Slave Binary +1 coding with 4 pins I/O

Preset #	In / Out 4	In / Out 3	In / Out 2	In / Out 1
1	0 / 0	0 / 0	0 / 0	0 / 0
2	0 / 0	0 / 0	0 / 0	1 / 1
3	0 / 0	0 / 0	1 / 1	0 / 0
4	0 / 0	0 / 0	1 / 1	1 / 1
5	0 / 0	1 / 1	0 / 0	0 / 0
6	0 / 0	1 / 1	0 / 0	1 / 1
7	0 / 0	1 / 1	1 / 1	0 / 0
8	0 / 0	1 / 1	1 / 1	1 / 1
9	1 / 1	0 / 0	0 / 0	0 / 0
10	1 / 1	0 / 0	0 / 0	1 / 1
11	1 / 1	0 / 0	1 / 1	0 / 0
12	1 / 1	0 / 0	1 / 1	1 / 1
13	1 / 1	1 / 1	0 / 0	0 / 0
14	1 / 1	1 / 1	0 / 0	1 / 1
15	1 / 1	1 / 1	1 / 1	0 / 0

9. Optional cables

Please take care of cable ends.
Bit tray and controller have the
same connectors
Plug cable connectors according to
labels indication.

9.1 Cable MDC 3 or 5m

Pin No	Bit socket tray	MDC controller	Pin No
1	Selection in1	Preset select OUT 1	10
2	Selection in2	Preset select OUT 2	11
3	Selection in3	Preset select OUT 3	12
4	Selection in4	Preset select OUT 4	13
5	X		
6	X		
7	X		
8	X		
9	Selection out1	Preset select IN 1	1
10	Selection out2	Preset select IN 2	2
11	Selection out3	Preset select IN 3	3
12	Selection out4	Preset select IN 4	4
13	X		
14	X		
15	X		
16	X		
17	X		
18	X		
19	Alarm (Tool Disable)	Driver Lock IN 6	6
20	GND (24V-)	Out COM	21
21	24V	In COM	22
23	COM IN		
24	COM OUT		

9.2 Cable SD/HD 3 or 5m

Pin No	Bit socket tray	SD/HD controller	Pin No
1	Selection in1		
2	Selection in2		
3	Selection in3		
4	X		
5	X		
6	X		
7	X		
8	X		
9	Selection out1	Preset select IN 1	1
10	Selection out2	Preset select IN 2	2
11	Selection out3	Preset select IN 3	3
12	X		
13	X		
14	X		
15	X		
16	X		
17	X		
18	X		
19	Alarm (Tool Disable)	Driver Lock	5
20	GND (24V-)	Out COM	21
21	24V	In COM	22
23	COM IN		
24	COM OUT		

9.3   Cable for other controllers DB25(M)-Open 5m

Cable name: BST/D25(M)-
OPEN,5M

Length : 5M

Date : 2018-
04-18

Pin no.	Direct	Binary, Binary+1	Wire ID
1	Selection in 1	Selection in 1	Black
2	Selection in 2	Selection in 2	Brown
3	Selection in 3	Selection in 3	Red
4	Selection in 4	Selection in 4	Orange
5	X	X	
6	X	X	
7	X	X	
8	X	X	
9	Selection out 1	Selection out 1	Yellow
10	Selection out 2	Selection out 2	Green
11	Selection out 3	Selection out 3	Blue
12	Selection out 4	Selection out 4	Violet
13	X	X	
14	X	X	
15	X	X	
16	X	X	
17	Analog output signal 0 - 5V	Analog output signal 0 - 5V	Gray
18	Tool Enable	Tool Enable	White
19	Alarm (Tool Disable)	Alarm (Tool Disable)	Red / White-
20	GND	GND	Yellow / Red-
21	24V	24V	Green / White-
23	COM IN	COM IN	Blue / White-
24	COM OUT	COM OUT	White / Red-

9.4   Cable for DPC Touch

To be used together with standard Y cable or MDC Y cable (see below)

DB25 (male) PLC DPC Touch Y cable	DB25 (male) 3m BIT SOCKET TRAY	Example of assigned signals DPCT
1		
2		
3		
4		
5		
6		
12		
13		
14	9	Input 9 : select 1
15	10	Input 10 : select 2
16	11	Input 11 : select 3
17	12	Input 12 : select 4
22	23	In Com
	20	*GND*
25	19	*Driver lock*
7		
8		
9		
10		
11	1	Output 9: Bit select 1 *
18	2	Output 10: Bit select 2 *
19	3	Output 11: Bit select 3 *
20	4	Output 12: Bit select 4 *
24	24	Out Com
	21	+24V

To be connected on PLC connector (sub D25)
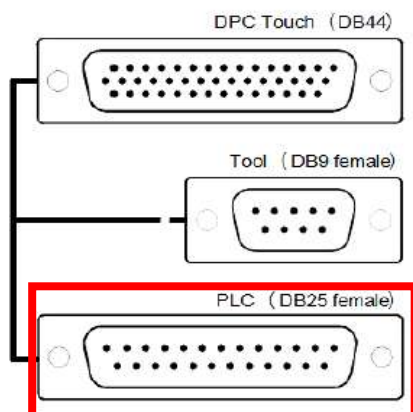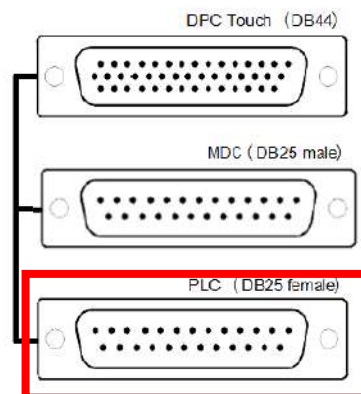
9.5   Cable for STANLEY series ALPHA V "QBE" Expert and Advanced controller

Bit tray is powered by Stanley controller.

Pin No	Bit socket tray	Alpha Advance	Pin No
1	Selection in1	Preset select OUT 1	F
2	Selection in2	Preset select OUT 2	G
3	Selection in3	Preset select OUT 3	H
4	Selection in4	Preset select OUT 4	J
5	X		
6	X		
7	X		
8	X		
9	Selection out1	Preset select IN 1	P
10	Selection out2	Preset select IN 2	R
11	Selection out3	Preset select IN 3	S
12	Selection out3	Preset select IN 4	T
13	X		
14	X		
15	X		
16	X		
17	X		
18	X		
19	Alarm (Tool Disable)	Driver Lock	M
20	GND (OV)	Out COM	V
21	24V	In COM	A-B
23	COM IN		
24	COM OUT		

10. SETTINGS for DOGA SYSTEMS

10.1 MD Series

Master (Preset or Model) Output Binary+1
Slave (Preset or Model) Input Binary +0

MDC controller settings:
Enter the parameters using menu > parameters > inputs/outputs
Input configuration:

Input 1	Program 1
Input 2	Program 2
Input 3	Program 3
Input 4	Program 4
Input 5	None (not assigned)
Input 6	Tool lock
Input 7	None (not assigned)
Input 8	None (not assigned)

Output configuration:

Output 1	Selection 1
Output 2	Selection 2
Output 3	Selection 3
Output 4	Selection 4
Output 5	None (not assigned)
Output 6	None (not assigned)
Output 7	None (not assigned)
Output 8	None (not assigned)

10.2 SD Series

Master (Preset or Model) Output Binary+0

SDC controller settings:
P20 setting = « 1 » input/output for PLC
            or « 3 » input/output for PLC except Run/Forward/Reverse by manual screwdriver
P86 setting = « 0 » for driver lock

PIN no.	Configuration	IN / OUT
1	Torque select IN1	INPUT (to Controller)
2	Torque select IN2	
3	Torque select IN3	
4	START	
5	Driver Lock (P86 : 0) Angle count start by signal (P86 : 1)	
6	F/R (Forward 0, Reverse 1)	
7	Model select IN3	
8	Multi-sequence (8-1) MA:1-0, MB:1-1	
9	Reset (include cycle reset) or Work-piece move OUT from area (P76 "3" selected)	
19	Work-piece move IN to area	
23	Model select IN1	
24	Model select IN2	
10	Error code OUT1	OUTPUT (from controller)
11	Error code OUT2	
12	Error code OUT3	
13	Error code OUT4	
14	Status of F/R OUT (F:0, R:1)	
15	Torque up (without verifying result)	
16	Status of Motor Run OUT	
17	READY	
18	ALARM (NG)	
20	Cycle count complete	
25	Fastening OK OUT (Verifying OK)	
21	Output COM	
22	Input COM	
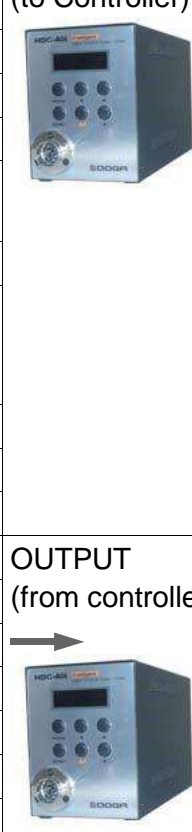
10.3 HDC Series

Master (Preset or Model) Output Binary+0

<u>HDC settings :</u>
P64 setting = « 1 » input/output for PLC
          or « 3 » input/output for PLC except Run/Forward/Reverse by manual screwdriver

PIN no.	Configuration	IN / OUT
1	Torque select IN1	← INPUT (to Controller)
2	Torque select IN2	
3	Torque select IN3	
4	START	
5	LOCK	
6	F/R (Forward 0, Reverse 1)	
7	Model select IN3 or Screw type (Clockwise 0, counterclockwise 1)	
8	Torque select IN4 for Multi sequence	
9	Reset (include cycle reset) or Work-piece move OUT from area (P76 "3" selected)	
19	Work-piece move IN to area	
23	Model select IN1	
24	Model select IN2	
10	Error code OUT1	OUTPUT (from controller) →
11	Error code OUT2	
12	Error code OUT3	
13	Error code OUT4	
14	Status of F/R OUT (F:0, R:1)	
15	Torque up	
16	Status of Motor Run OUT	
17	READY	
18	ALARM (NG)	
20	Cycle count complete	
25	Fastening OK OUT	
21	Output COM	
22	Input COM	

10.4 DPC Touch

Settings using standard Bit Tray cable to DPC Touch.

-Slave mode
-BST input IO type : Input Binary +0
-DPC Touch Outputs 9, 10, 11 and 12 are used for bit selection* with binary coding
-DPC Touch Outputs must remain unassigned in order to create a continuous type output step to select the corresponding bit.
 *Mapping enable should be set OFF.

DPC Touch I/O settings

-DPC Touch Inputs 9, 10, 11 and 12 are used to read bit selection echo.
-Preset Output should be set ON

Note: concern BST connected to DPC Touch and MDC with specific Y cable:
BST 'tool disable' output is directly wired to MDC input 4.
MDC input 4 have to be set with 'Lock driver' function.

10.5 STANLEY series ALPHA V "QBE" Expert and Advanced controller

-Master (Preset or Model) Output Binary+1
-Slave (Preset or Model) Input Binary +0

Alpha controller I/O settings:
-Pins F, G, H, J and P, R, S, T are used to select the assembly bit
Configure the outputs using menu:
Setup \ Other > I/O > 24V (Out)

Out F	**24V (Out)** C IN CYCLE D READY E DISASSEMBLY DETECTED **F JOB SELECTED (BIT)**	**F JOB SELECTED (BIT)** Contact Type — N.O. Bit — 0 Mode — BINARY
Out G	**24V (Out)** C IN CYCLE D READY E DISASSEMBLY DETECTED F JOB SELECTED (BIT) **G JOB SELECTED (BIT)**	**G JOB SELECTED (BIT)** Contact Type — N.O. Bit — 1 Mode — BINARY
Out H	**24V (Out)** C IN CYCLE D READY E DISASSEMBLY DETECTED F JOB SELECTED (BIT) G JOB SELECTED (BIT) **H JOB SELECTED (BIT)**	**H JOB SELECTED (BIT)** Contact Type — N.O. Bit — 2 Mode — BINARY
Out J	**24V (Out)** C IN CYCLE D READY E DISASSEMBLY DETECTED F JOB SELECTED (BIT) G JOB SELECTED (BIT) H JOB SELECTED (BIT) **J JOB SELECTED (BIT)**	**J JOB SELECTED (BIT)** Contact Type — N.O. Bit — 3 Mode — BINARY

Configure the inputs using menu:
Setup \ Other > I/O > 24V (In)

In M	24V (In)	M STOP	
	L START	Contact Type	N.O. ▾
	M STOP		

In P	24V (In)	P SELECT JOB (BIT)	
	L START	Contact Type	N.O. ▾
	M STOP	Bit	0
	N REVERSE	Mode	BINARY ▾
	P SELECT JOB (BIT)		

In R	24V (In)	R SELECT JOB (BIT)	
	L START	Contact Type	N.O. ▾
	M STOP	Bit	1
	N REVERSE	Mode	BINARY ▾
	P SELECT JOB (BIT)		
	R SELECT JOB (BIT)		

In S	24V (In)	S SELECT JOB (BIT)	
	L START	Contact Type	N.O. ▾
	M STOP	Bit	2
	N REVERSE	Mode	BINARY ▾
	P SELECT JOB (BIT)		
	R SELECT JOB (BIT)		
	S SELECT JOB (BIT)		

In T	24V (In)	T SELECT JOB (BIT)	
	L START	Contact Type	N.O. ▾
	M STOP	Bit	3
	N REVERSE	Mode	BINARY ▾
	P SELECT JOB (BIT)		
	R SELECT JOB (BIT)		
	S SELECT JOB (BIT)		
	T SELECT JOB (BIT)		

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