

Bit change system for robotics and automation

Part number 020043

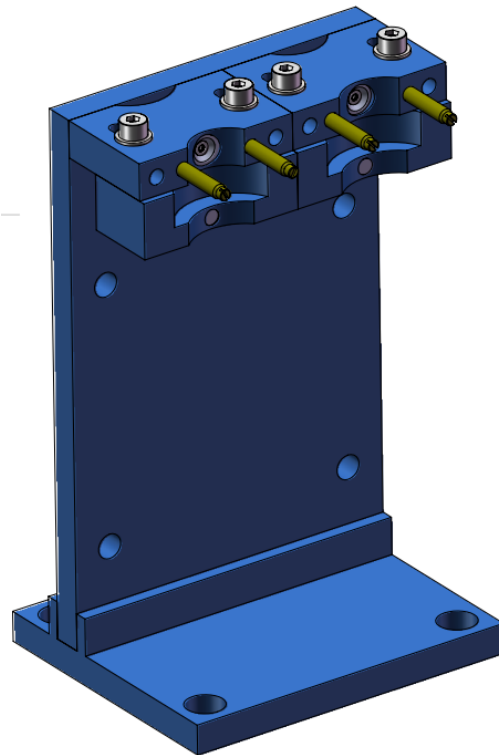
Manual

INTRODUCTION

The Kolver bit change system accessory (part number 020043) is designed to allow robotic and automated screwdriving systems to switch between different screwdriving bits with no user intervention.

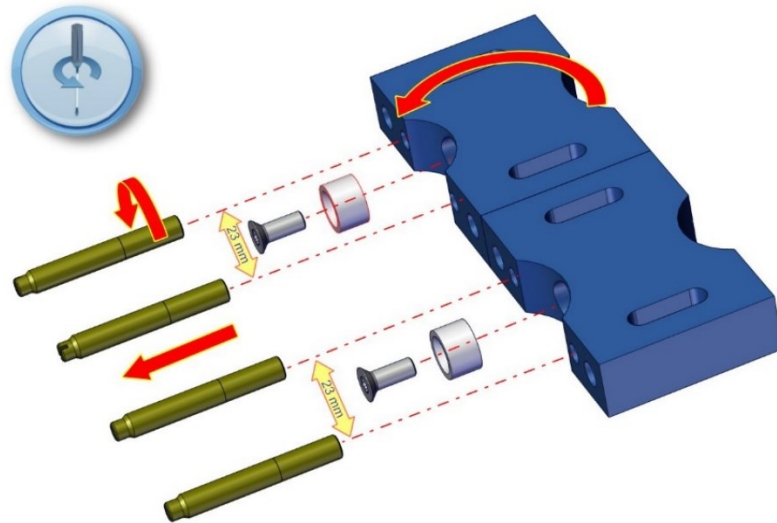
The operating principle is as follows:

- The bits attach to the screwdriver via a spring plunger
- The bit change station must be securely attached to the table or to the wall in a fixed position
- When docked on the bit change system, the bits are locked vertically but not horizontally
- A magnet secures the bit horizontally and a proximity sensor detects its presence or absence
- The robot attaches the bits by pushing downward while the screwdriver rotates slowly (50RPM)
- The robot pulls away horizontally to undock the bit
- To disengage from the bit, the robot returns to the docking area with a horizontal motion, then pulls up and away. The spring plunger will disengage
- The proximity sensors can be connected to the robot or PLC or to the K-DUCER
- Multiple bit change systems can be used to match the required number of bits

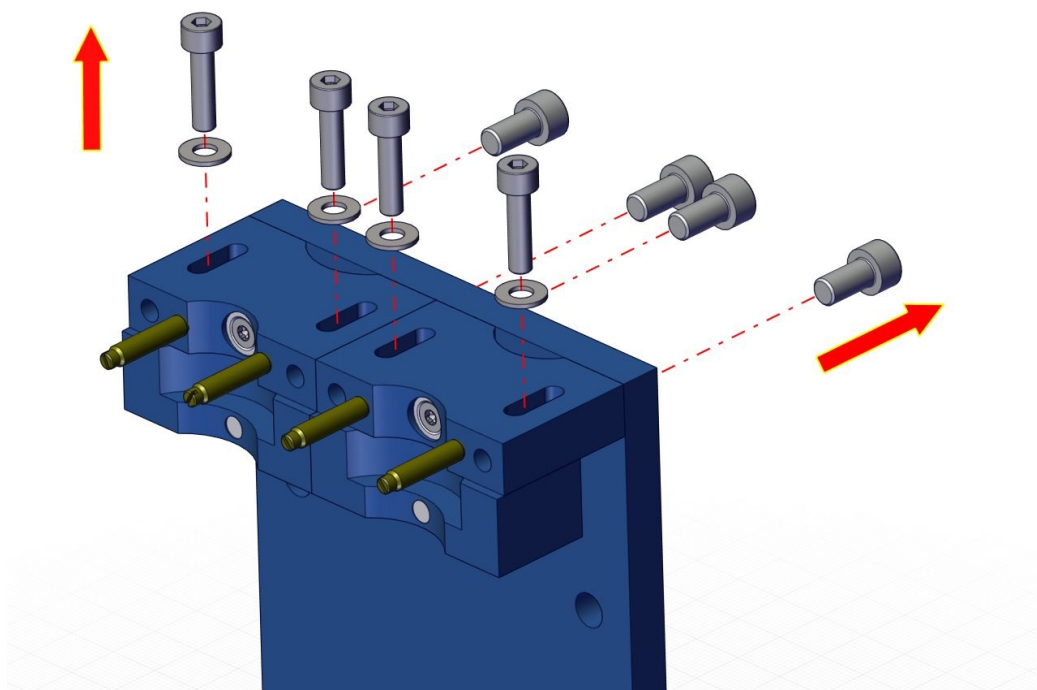


The docking area is two-sided, to accommodate bit-holders or sockets with a groove diameter of 19-20mm (narrow side) or 22-23mm (wide side).

Remove the horizontal screws on the back to release the docks, then rotate 180° to switch between the narrow and wide side pin slots.



The bottom side of the docks can be adjusted horizontally to accommodate different size bitholders and sockets. Loosen the vertical screws on the top side to release and adjust the bottom side of the docks.



COMPATIBLE BITHOLDERS AND SOCKETS

The adjustable bottom side of the docking areas can accommodate different brands and shapes, provided the groove diameters remain similar (19/20 or 22/23mm).

For best results, use Wera part number 784 B (3/8" square to 1/4" hex) as a universal hex bit holder, and Wera impactor sockets (19mm or 22mm diameter), as this is what the system was designed to accommodate.



To engage and disengage with the bitholders and sockets, a plunger-based retaining mechanism must be used.

If your robot does not have either a force-push mode or axial compliance, the Kolver compensator system with axial compliance should be used. Kolver CA/FN drivers already come with an axial compensator. A compensator can also be purchased separately (special request only for a compensator with spring plunger). Contact Kolver for more information.



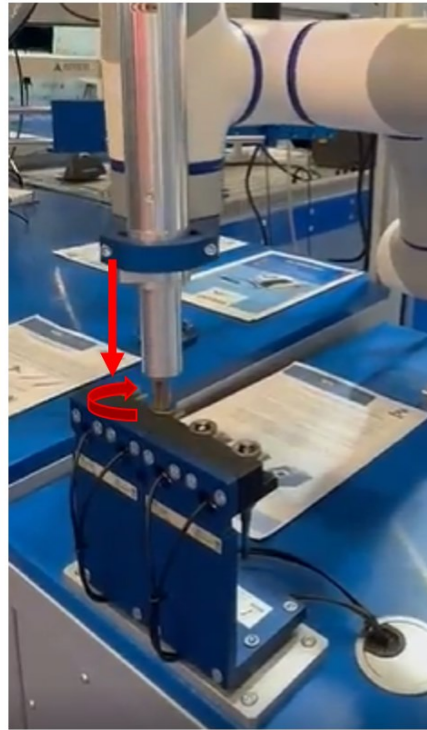
If your robot has a force push mode, you can use any bit with a spring plunger to engage with the bitholders/sockets. Use the shortest bit available to minimize wobble.



OPERATION



1. Approach



2. Rotate + push = engage



3. Pull away horizontally

4. Repeat in reverse to undock

PROXIMITY SENSOR WIRING

The bit change system comes with Balluff proximity sensors BES05J8 (PNP). These can be wired to your robot or PLC to detect the proper engagement of the bit. They can also be wired directly to the KDU-1A controller to automatically select programs.

Excerpt from the KDU-1A user manual (the CN3 BITx IN MODE is found in the General Settings menu):

PNP sens X mode

This mode is designed for Kolver accessory 020043, or PNP proximity sensors for bit selection, intended to be used with a robot or automatic machine.

The number after the X stands for the number of sensors being used, two to six.

X + 1 programs can be selected in this mode.

The brown positive wire of each PNP sensor must be wired to the +24VDC source (PIN 21).

The blue negative wire of the each PNP sensor must be wired to GND (PIN 22).

The black signal wire of the first sensor must be wired to BIT1 PR.

The black signal wire of the second sensor must be wired to BIT2 PR.

And so on, each additional sensor should be wired to the next available BITxPR.

When both proximity sensors are active, indicating proximity, program X + 1 will be selected. This program is intended to contain the parameters for picking up the bit (minimum speed recommended and low torque).

When only one proximity sensor is negative, indicating no proximity (bit removed), the program corresponding to the BITxPR wired to the indicating sensor is selected.

When more than one proximity sensors is negative, indicating more than one bit removed, the “No program selected” screen will appear.

For example:

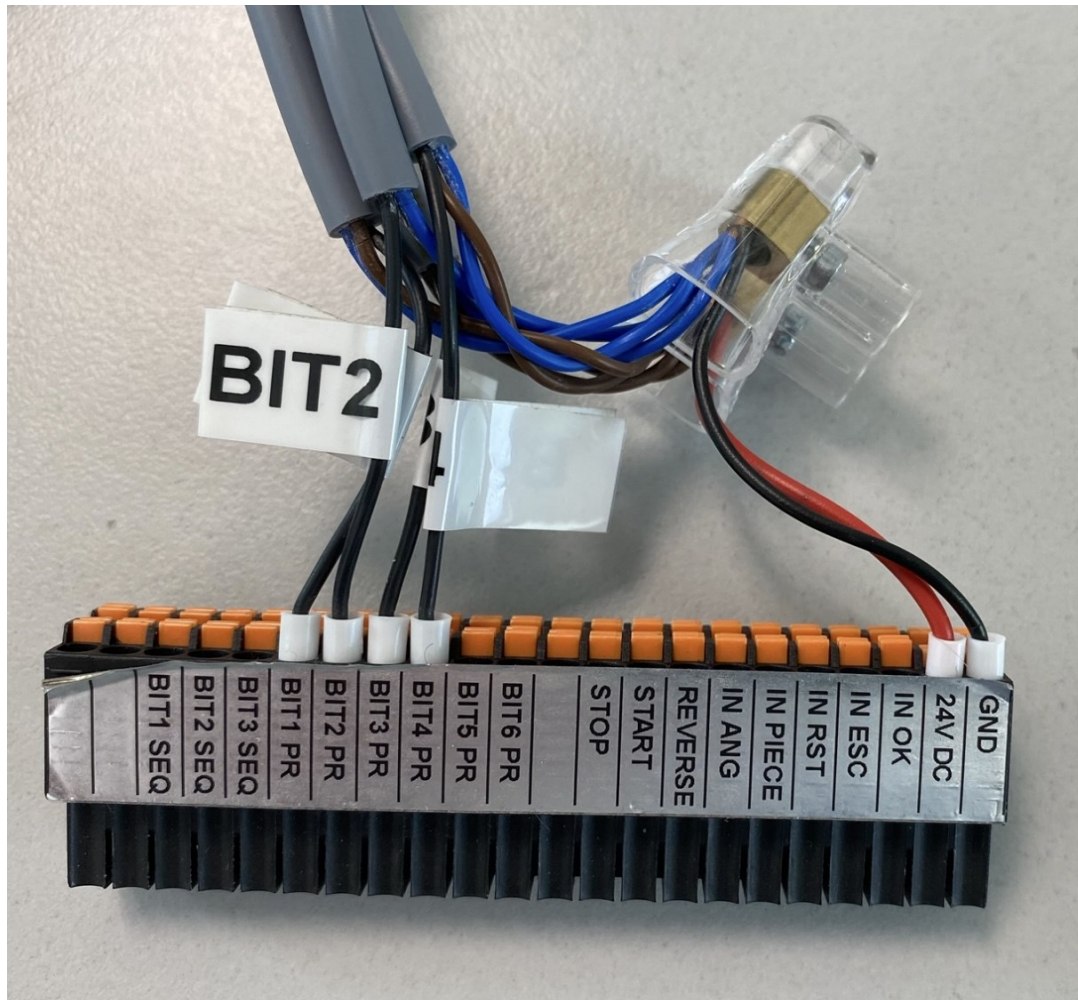
CN3 BITx IN MODE set to “pnp sens x3”:

Three brown PNP sensor wires will go to PIN 21 (+24VDC), three blue PNP sensor wires will go to GND (PIN 22), then one black wire from each sensor will go into BIT1PR, BIT2PR, and BIT3PR.

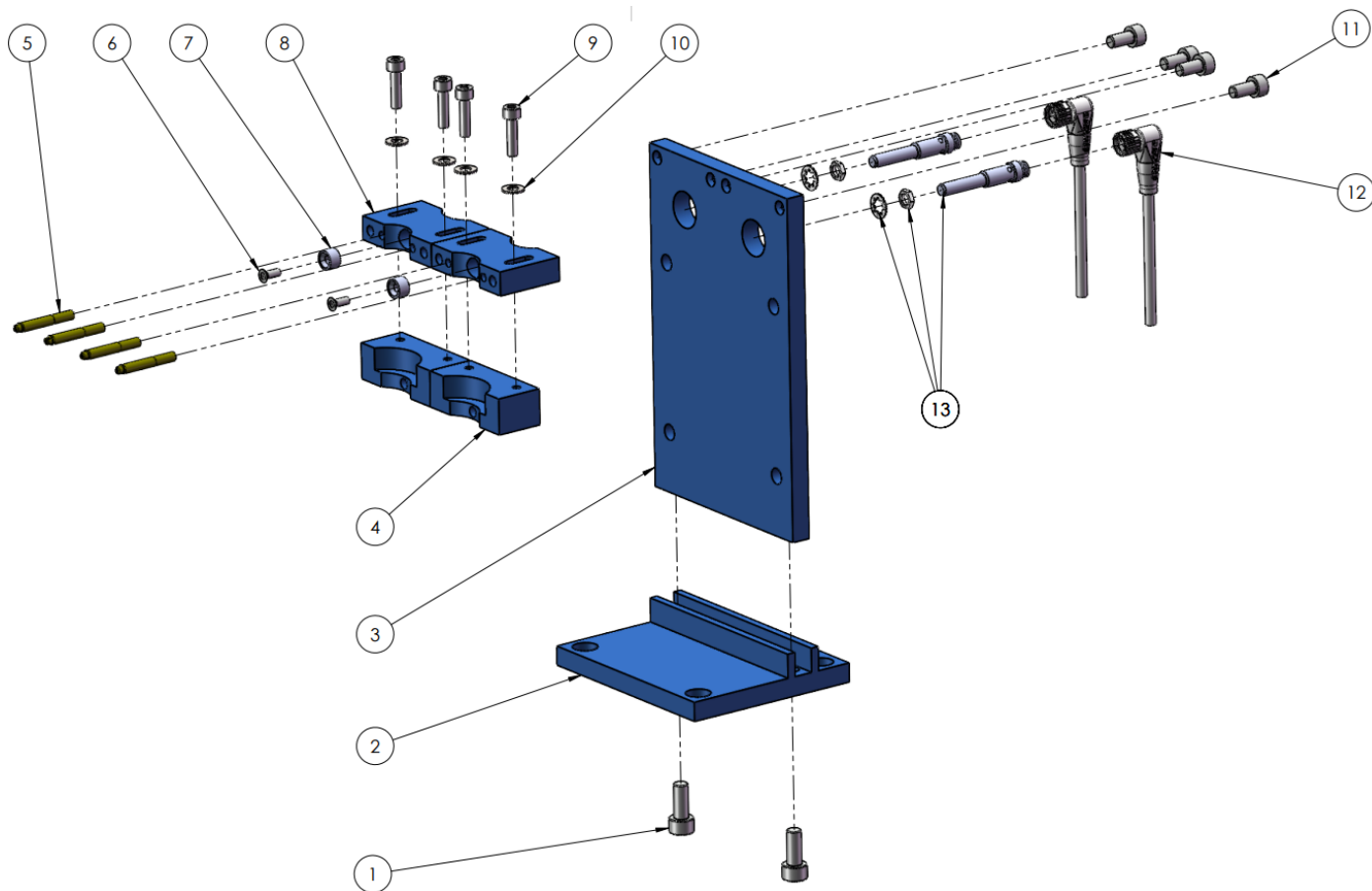
When no bits are removed, program number 4 is selected.

When **only** bit of sensor 2 (wired to BIT2PR) is removed, program 2 is selected (and likewise for only bit 1 or bit 3 removed).

When more than one bit is removed, no programs are selected (invalid selection).



EXPLODED DRAWING AND PARTS



NUM. ARTICOLO	DESCRIZIONE	CODICE	QUANTITÀ
1	VITE BN3 M6X14	872514	2
2	PIASTRA ORIZZONTALE SUPPORTO SGANCIO RAPIDO	895161	1
3	PIASTRA SUPPORTO SGANCIO RAPIDO	895160	1
4	FERMABUSSOLA	895164	2
5	SPINA AZIONAMENTO MICRO	234635	4
6	BN4851 M2X10MM TX6	231750	2
7	MAGNETE DIAMETRO 8mm	895167	2
8	SUPPORTO SGANCIO RAPIDO UNIVERSALE	895163	2
9	BN3 VITE TCEI 8.8 M4X16 ZN	240020/ZN	4
10	BN715 RONDELLA PIANA M4	895166	4
11	BN3 VITE M5 X 10 TCEI	231503	4
12	CAVO M8X1 3 POLI 90°	895165	2
13	SENSORE PNP M8 THREAD M5X0,5	895162	2