



**DEPRAG**

**The EC-Servo-Screwdriver  
with the smallest diameter  
on the market**

## **MINIMAT-E Electric Stationary Screwdriver Spindles** straight and angle-head design

**The brushless Electric Screwdriver Spindle with  
integrated torque- and angle transducer from  
0.2 - 270 Nm (2 - 2.390 in.lbs)**

The DEPRAG EC Screwdriver Spindles enable the free programming of the screw tightening process. Within the power range of each corresponding spindle, the torque, speed, stand by and turn direction can be adjusted individually to the assembly requirement. When using these spindles in connection with our Robotic Screwdriving Cells, it is possible to achieve, within one cycle, different tightening parameters for different screwdriving positions.

The brushless electric motors provide maintenance free operation. They assure outstanding dynamics and an achievement of high peak torque values – ideally suited for the tightening of screws. Integrated torque- and angle Transducers provide the means for an exact control, respectively regulation of the screw-tightening process, as well as the documentation of all important process parameters.



## Technical Data



Screwdriver reversible with quick change chuck	type order no.	310E30-002	310E30-005
Torque min.	Nm / in.lbs	0.2 / 2	0.8 / 8
Torque max.	Nm / in.lbs	2 / 18	5 / 44
Speed min.	rpm	50	25
Speed max.	rpm	1200	600
Diameter	mm / in.	30 / 1 3/16	30 / 1 3/16
Length	mm / in.	340 / 13 3/8	340 / 13 3/8
Weight	kg / lbs.	1.1 / 2.4	1.1 / 2.4
Noise level	dB (A)	62	62
Line voltage (DC)	V	300	300
Internal hex. drive	DIN 3126	F6.3 (1/4")	F6.3 (1/4")
Suitable tool inserts and connecting components with a drive as per DIN 3126		E6.3 (1/4")	E6.3 (1/4")
Torque measuring system			
DMS (strain gage) fully bridged accuracy classification		yes 1	yes 1
Angle encoder			
channel		A-B	A-B
resolution	degree	1	1



Screwdriver reversible with quick change chuck	type order no.	310E36-005	310E36-012	310E36-018	310E36-025
Torque min.	Nm / in.lbs	1 / 9	2 / 18	4 / 35	5 / 44
Torque max.	Nm / in.lbs	5 / 44	12 / 106	18 / 159	25 / 221
Speed min.	rpm	50	25	20	15
Speed max.	rpm	1000	600	450	350
Diameter	mm / in.	36 / 1 7/16	36 / 1 7/16	36 / 1 7/16	36 / 1 7/16
Length	mm / in.	390 / 15 3/8	390 / 15 3/8	390 / 15 3/8	390 / 15 3/8
Weight	kg / lbs	1.8 / 4	1.8 / 4	1.85 / 4.1	1.85 / 4.1
Noise level	dB (A)	62	62	62	62
Line voltage (DC)	V	300	300	300	300
Internal hex. drive	DIN 3126	F6.3 (1/4")	F6.3 (1/4")	F6.3 (1/4")	F6.3 (1/4")
Suitable tool inserts and connecting components with a drive as per DIN 3126		E6.3 (1/4")	E6.3 (1/4")	E6.3 (1/4")	E6.3 (1/4")
Torque measuring system					
DMS (strain gage) fully bridged accuracy classification		yes 1	yes 1	yes 1	yes 1
Angle encoder					
channel		A-B-I	A-B-I	A-B-I	A-B-I
resolution	degree	1	1	1	1



Screwdriver reversible	type order no.	310E56-022	310E56-040	310E56-090	310E56-140	310E56-270
Torque min.	Nm / in.lbs	4 / 35	8 / 71	15 / 133	25 / 221	50/442
Torque max.	Nm / in.lbs	22 / 195	40 / 354	90 / 796	140 / 1240	270 / 2390
Speed min.	rpm	50	25	10	10	5
Speed max.	rpm	1500	800	350	300	100
Diameter	mm / in.	56 / 2 13/64	56 / 2 13/64	56 / 2 13/64	56 / 2 13/64	56 / 2 13/64
Length	mm / in.	510 / 20 1/16	510 / 20 1/16	510 / 20 1/16	510 / 20 1/16	580 / 22 27/32
Weight	kg / lbs	6.5 / 14.3	6.5 / 14.3	6.5 / 14.3	6.5 / 14.3	7 / 15.4
Noise level	dB (A)	62	62	62	62	62
Line voltage (DC)	V	300	300	300	300	300
External square drive	DIN 3121	F12.5 (1/2")	F12.5 (1/2")	F12.5 (1/2")	F12.5 (1/2")	F20 (3/4")
Suitable tool inserts and connecting components with a drive as per DIN 3121		G12.5 (1/2")	G12.5 (1/2")	G12.5 (1/2")	G12.5 (1/2")	H20 (3/4")
Torque measuring system						
DMS (strain gage) fully bridged accuracy classification		yes 1	yes 1	yes 1	yes 1	yes 1
Angle encoder						
channel		A-B-I	A-B-I	A-B-I	A-B-I	A-B-I
resolution	degree	1	1	1	1	1

Please find suitable tool inserts in our brochure D 3320 E.

## Technical Data

### Angle head design

Screwdriver reversible		type order no.	310EW36-0075-E10 200952 A	310EW36-0180-E10 200952 B	310EW36-0250-E10 200952 C	310EW36-0360-E10 200952 D
Torque	min.	Nm / in.lbs	1.5 / 13.3	3.5 / 31	5 / 44	7 / 62
Torque	max.	Nm / in.lbs	7.5 / 66.4	18 / 159	25 / 221	36 / 319
Speed	min.	rpm	35	20	15	10
Speed	max.	rpm	620	375	280	210
Diameter		mm / in.	36 / 1 7/16	36 / 1 7/16	36 / 1 7/16	36 / 1 7/16
Length		mm / in.	390 / 15 3/8	390 / 15 3/8	390 / 15 3/8	390 / 15 3/8
Weight		kg / lbs	3.1 / 6.8	3.1 / 6.8	3.1 / 6.8	3.1 / 6.8
Noise level		dB (A)	65	65	65	65
Line voltage (DC)		V	300	300	300	300
External square drive		DIN 3121	E10 (3/8")	E10 (3/8")	E10 (3/8")	E10 (3/8")
Suitable tool inserts and connecting components with a drive as per DIN 3121			G10 (3/8")	G10 (3/8")	G10 (3/8")	G10 (3/8")
Torque measuring system						
DMS (strain gage) fully bridged accuracy classification			yes 1	yes 1	yes 1	yes 1
Angle encoder						
channel			A-B-I	A-B-I	A-B-I	A-B-I
resolution		degree	1	1	1	1



The AST30 programmable sequence controller is used to operate the screwdriver spindle. The AST30 features an LCD display and numeric keypad to allow the driving parameters to be monitored or changed without connection to a PC. It also has an integral power supply, so only two cables, motor drive and signal measurement, are required. These cables are available in different lengths to facilitate mounting in your system.

Typically, the original programs are loaded into the AST30 from a PC, using the very user friendly Windows® software TC30-PC which is included in every AST30 controller. Latest software updates and the corresponding modules (statistics, graphics etc.) are available at special request. These programs are then invoked by the same PLC that drives your system. The results of the cycle can be fed back to the PLC for subsequent operations. This data can also be communicated through the integral Profi bus port.

Connected multi-spindle systems can be controlled through the profi bus port or an optional Ethernet in connection with an IPC connection. This allows complete process control (screwdriving curve, statistics, archiving) and the data exchange with a data acquisition system.

On special request, we can also provide a data logger transferring the measuring data of several controllers to a PC via different interface connectors (such as USB, Ethernet).

## Required Accessories



Sequence controller

Sequence controller for Screwdriver 310E30-xxx	type order no.	AST30-1-230 V 388720 A	AST30-1-115V 388720 B
Sequence controller for Screwdriver 310E36/56-xxx and 310EW36-xxx	type order no.	AST30-2-230 V 388721 A	AST30-2-115V 388721 B
Power unit (AC)	V / Hz	230 / 50 (60)	115 / 50 (60)
Power consumption (AST30-1)	VA	400	400
Power consumption (AST30-2)	VA	800	800
Insulation		IP54	IP54
LC-display		4 lines	4 lines
Membrane keyboard		yes	yes
RS 232 interface		yes	yes
Profi bus		yes	yes
Ethernet		optional	optional
Amount of connectable spindles		1	1
Dimensions (W x H x D)	mm / in.	170 x 295 x 340 / 6 <sup>11</sup> / <sub>16</sub> x 11 <sup>5</sup> / <sub>8</sub> x 13 <sup>3</sup> / <sub>8</sub>	
Weight	kg / lbs	9.5 / 21	9.7 / 21.3

Programming kit no. 385426 C (consisting of operating manual, software package and programming cable) is a single standard component of the sequence controller.

Motor cable (spindle to sequence controller)			
Standard			<b>KMO AST30-5m</b>
Length 5 m / 16.4 ft.	type order no.		388730 A
Alternatives	type order no.		<b>KMO AST30-2.5m</b>
Length 2.5 m / 8.2 ft.	type order no.		388730 D
Length 8 m / 26.2 ft.	type order no.		<b>KMO AST30-8m</b>
Length 12 m / 39.4 ft.	type order no.		388730 B
	type order no.		<b>KMO AST30-12m</b>
	type order no.		388730 C

Measuring cable (spindle to sequence controller)			
Standard			<b>KME AST30-5m</b>
Length 5 m / 16.4 ft.	type order no.		388731 A
Alternatives	type order no.		<b>KME AST30-2.5m</b>
Length 2.5 m / 8.2 ft.	type order no.		388731 D
Length 8 m / 26.2 ft.	type order no.		<b>KME AST30-8m</b>
Length 12 m / 39.4 ft.	type order no.		388731 B
	type order no.		<b>KME AST30-12m</b>
	type order no.		388731 C

## Optional Equipment



Remote display keypad module

PC-Software	type order no.	TC30-PC 828560
TC 30-PC statistic	order no.	828634
TC 30-PC data logger	order no.	829085
TC 30-PC to QS-STAT conversion programme**) (additional modules at request)	order no.	830458
<b>Software Addition:</b>		
Shut-off at effective torque	order no.	829613
Friction controlled fastening to torque	order no.	829614
<b>Remote display keypad module</b> (incl. connecting cable 3 m/10 ft.) additional length available	type order no.	<b>AST30-DT</b> 388727 A
<b>Ethernet-Module</b>	type order no.	<b>AST30-EN</b> 388729 A
Programming cable PC to AST30 (USB)	order no.	831420
Printer ND100 *)	order no.	823476
Cable AST30 to ND100	order no.	385419 A
Data cable AST 30 to PC	order no.	385423 A
Support for AST 30	order no.	947405 A

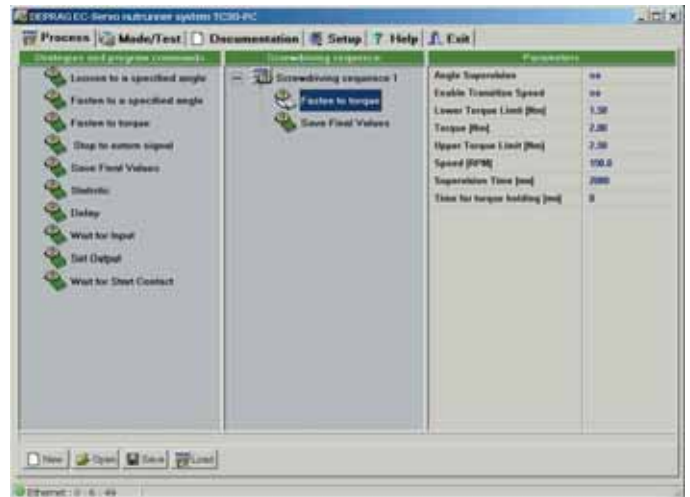
\*) for additional technical data please refer to catalog D 3022 E  
\*\*) in conjunction with data logger only

The remote display keypad module is a very good solution, if it is not possible to operate directly the sequence controller. Integrating it into a suitable control cabinet will allow to position it at almost any place. Its complete function and operation is identical to the one of its respective basic controller which assures best possible handling.

# Easy programming of the TC 30-PC software

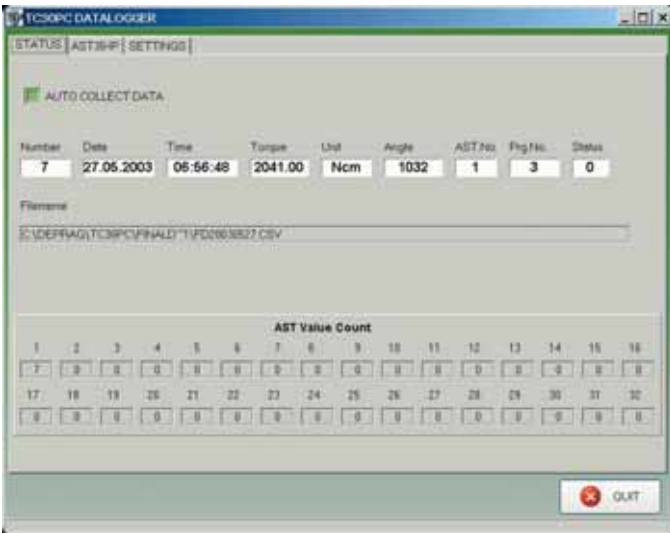


Master menu of the PC software

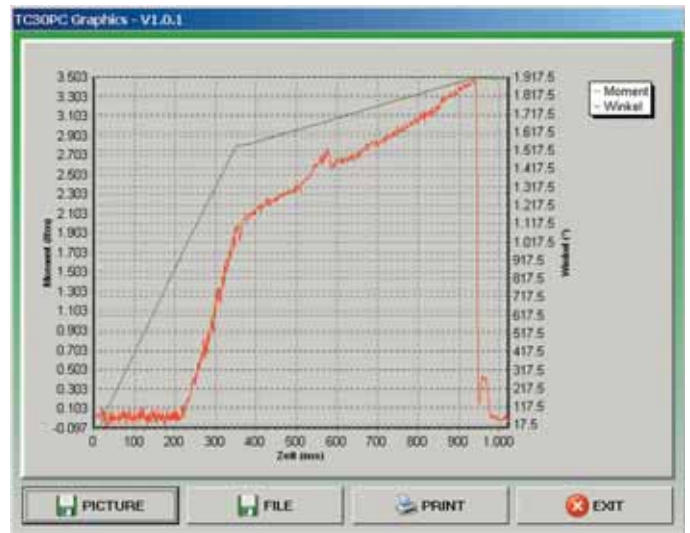


Software for set-up of screwdriving program

## Additional modules for TC30-PC software



**TC30-PC data logger**  
for storing screwdriving data of up to 32 screwdriver controllers in one file. This can be handled further by MS-Excel or AST30-statistics-software.



**TC30-PC graphic** (included in delivery) for graphics analysis of different screw joints.

NUMBER	START	END
498	16.07.2003 09:47:28	16.07.2003 10:25:27

UNIT	AVERAGE	STD DEV	5%
Nm	2.01	0.011	0.548

CMK	CMK	LOWER-LIMIT	UPPER-LIMIT
9.15	9.15	1.708	2.311

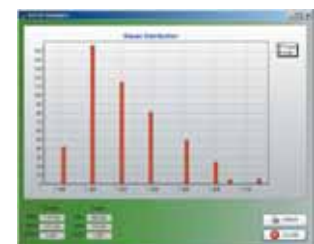
Number	Date	Time	Torque	Angle	AST-No.	Prg No.
1	16.07.2003	09:35:48	0.02	1090	1	2
2	16.07.2003	09:36:11	0.01	1090	1	2
3	16.07.2003	09:37:06	0.05	1090	1	2
4	16.07.2003	09:39:10	1.50	1248	1	1
5	16.07.2003	09:47:28	2.02	907	1	3
6	16.07.2003	09:47:30	0.04	901	1	4
7	16.07.2003	09:47:32	2.01	896	1	3
8	16.07.2003	09:47:36	0.03	902	1	4
9	16.07.2003	09:47:37	2.00	909	1	3

**TC30-PC statistic**  
Statistics software for evaluation of the screwdriving data and calculation of average value, standard deviation and cmk value.

For the graphic display several alternatives may be selected.



Selection of the display



Gauss distribution presentation

## More Optional Equipment



To suit controller	type	AST 30-..	
<b>Toolbox</b>	<b>type</b>	<b>TB 7</b>	
	order no.	398097 A	
Data:		7	
Tool holders		upto Ø 24 / 0.9 (AF 19)	
Tool size	mm / in.	DC 24	
Voltage	V	100	
Amperage	mA	SUB-D 15-pin connector	
Input / output interface		4-pin connector	
Start signal		225 x 50 x 120 / 8.8 x 1.9 x 4.7	
Dimensions (W x H x D)	mm / in.	1.2 / 2.6	
Weight	kg / lbs		
<b>Optional equipment:</b>			
Connecting cable AST 30 - Toolbox	order no.	950443 A	

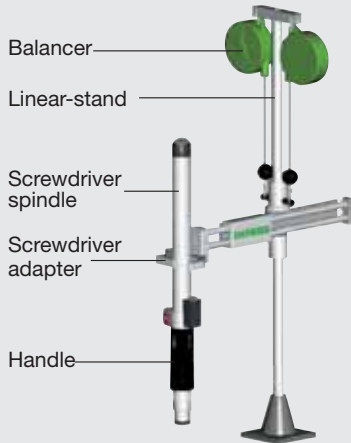
This Toolbox increases the AST 30 application range concerning both manual working stations and in conjunction with PLC controllers. It can be used with upto 7 tools with a diameter of upto 24 mm (AF 19). The selection of the AST 30's screwdriving programs will be done automatically and will suit the selected tool. LED's will show the OKAY/NOT OKAY assemblies as well as the readiness of the Toolbox and the AST 30. Through the 24 Volt input / output interface the Toolbox will be connected directly to the AST 30 or a PLC controller. Applicability of the start signal will be checked in conjunction with the handles (see below) and this allows for the best possible operator handling and process security.



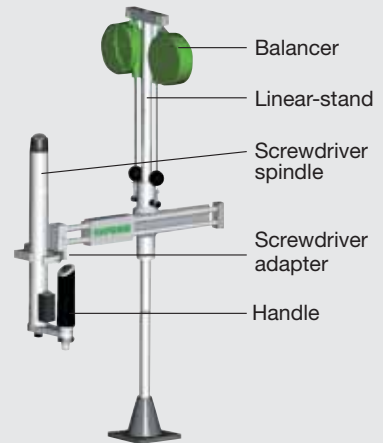
To suit screwdriver spindle	type	310E30-..	310E36-..	310E56-..
<b>Handle (in line with spindle) without screwfeeding</b>				
Start switch version	order no.	395890 D	395890 B	-
Rocker switch version	order no.	395890 E	395890 G	-
<b>Handle (in line with spindle) with screwfeeding</b>				
Start switch version	order no.	395890 A	395890 C	-
Rocker switch version	order no.	395890 H	395890 I	-
<b>Handle (at side of spindle) with and without screwfeeding</b>				
Rocker switch version only	order no.	961938 K	961938 E	961938 N
<b>Linear stand</b>				
Torque range	0 - 20 Nm	order no.	408010 A	408010 A
	15 - 50 Nm	order no.	-	408010 B
	50- 150 Nm	order no.	-	-
				408010 C
<b>Screwdriver adapter</b>				
for linear stand	0 - 20 Nm	order no.	395711/1	949800/1
	15 - 50 Nm	order no.	-	949800/1
	50- 150 Nm	order no.	-	-
				-
				920631
				920632
Please find suitable balancers in our brochure D 3340 E – Workplace equipment and accessories				

With the use of these handles (in combination with the linear stand) our EC spindles can also be operated in manual work places.

# Examples

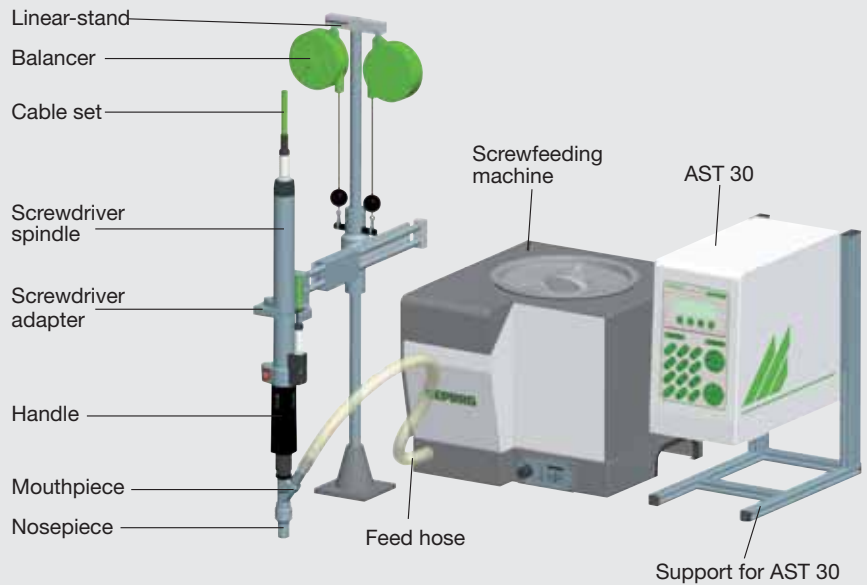


without screwfeeding, handle in line with spindle



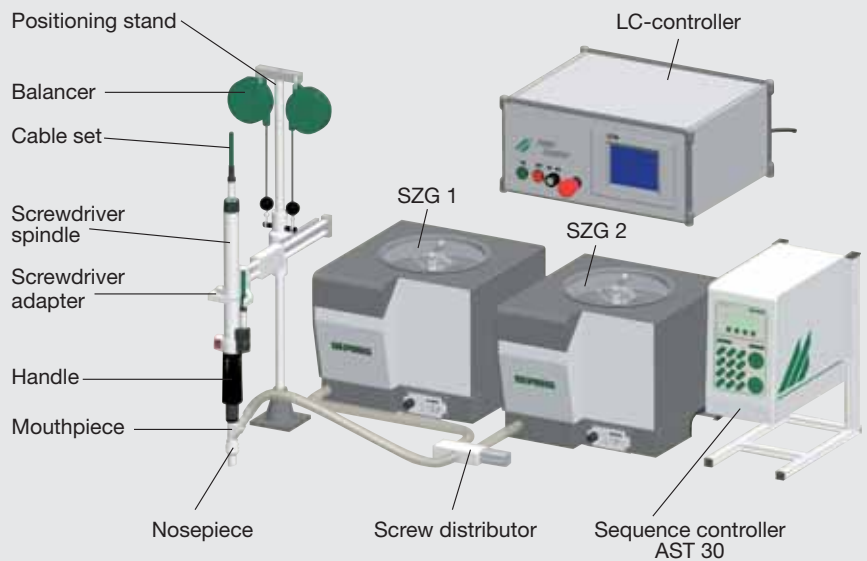
without screwfeeding, handle at side of spindle

with screwfeeding  
for 1 screw,  
with linear stand

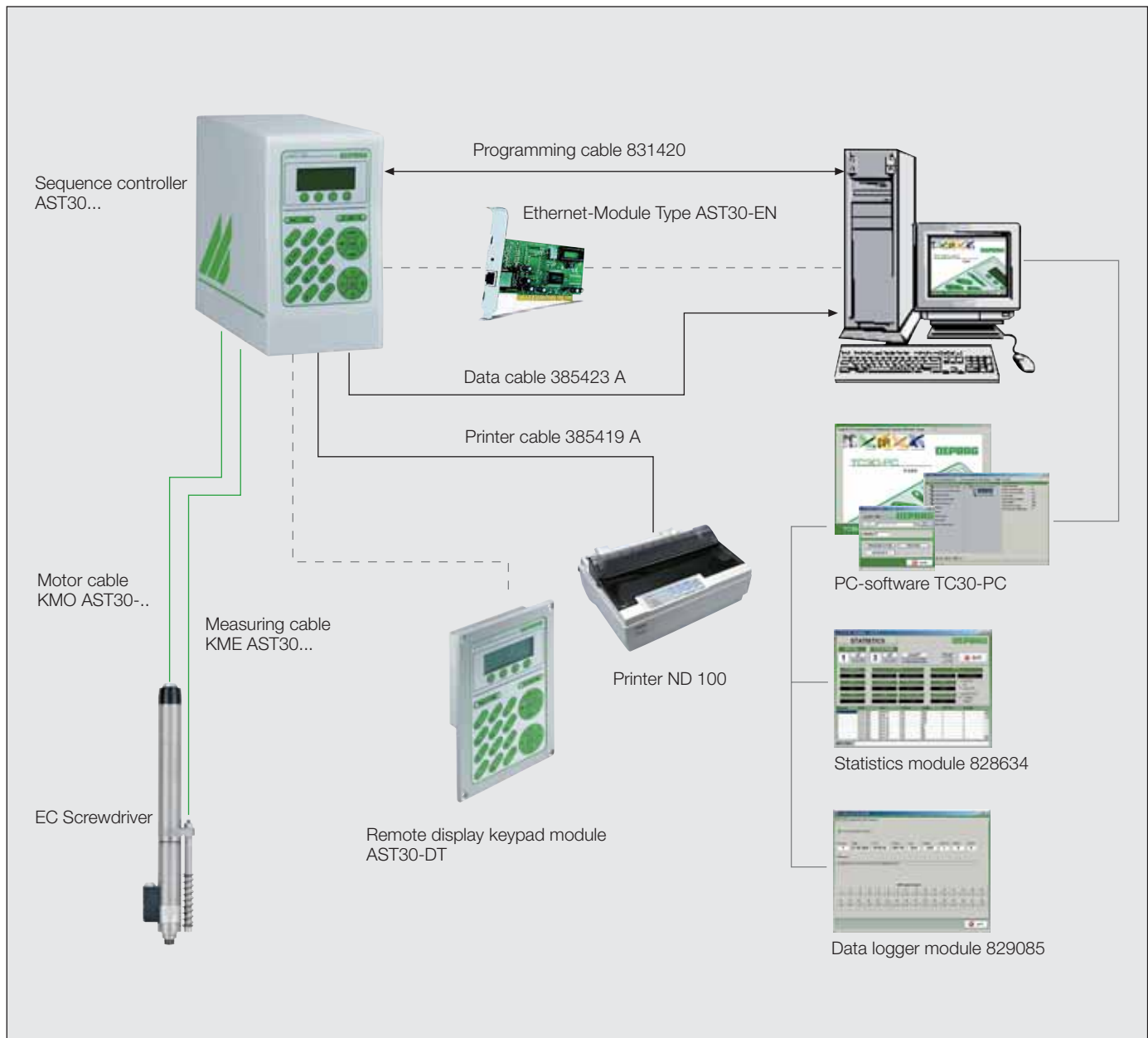


with screwfeeding

for 2 different screws, with positioning  
stand for recognition of screw position.  
Suitable screw will be selected as per  
screw position.



## Options to combine the EC-screwdriver technology



# DEPRAG

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