



DEPRAG



Controllers

Sequence Controllers for Screwdriving- and Assembly Stations

- **The integrated standard software guarantees highest quality standards!**
- **Simple and safe operation**
- **Specific and clear indication**
- **Low cost solution through an optimized adaptation into DEPRAG-Screwdriving- and Assembly Stations**
- **Maintenance performed by remote access**

All DEPRAG controllers consist of well-tuned software and hardware components and allow the complete operation of screwdriving stations, screw-feeding machines and assembly systems. With their well-tested, standardized design it is possible to build economic, functionable systems in very short time.

Benefit from our wide range of experience after successfully realizing a large number of projects!

An optionally available remote access maintenance package guarantees a quick and effective response by our service technicians without the necessity of expensive field service.



As an entry-level solution, the DEPRAG basic controller LC120 allows operation of single screwdriving and screwfeeding systems.

For more complex applications/systems the DEPRAG standard controllers LC124, LC156 and LC172 are provided for the operation of screwdriving and assembly stations with upto 72 in/outputs. All available feeding systems will be accepted here. These controllers include all necessary operator elements, touch panel, power supply, E-stop circuit and controller modules. They are S7-200-compatible and can be programmed by means of the Siemens STEP-7-MICRO-WIN-32 software. The touch panel is easy to read even from large distance and allows handling by finger or pen.

The LC2plus controller represents a flexible and powerful new addition to the LC series. The basic switchboard cabinet even contains each 32 inputs and outputs.

LC2plus:

The use of a profibus allows almost unlimited control of inputs and outputs and further peripheral devices.

A basic 48 Kbyte memory and a 2 Mbyte data memory make the realisation of even large projects possible. The TP2plus-display/operating panel was designed to suit the LC2plus and with the graphic 5,7" touch screen offers the best possible handling.

All controllers also comprise a substantial program for manual operation which allows monitoring and controlling of sensors and actuators. In automatic mode all end switches are checked and in case of failure or mis-adjustment will be shown on the touch panel in clear text.

All process parameters, measurements and cycle counters are displayed on easy to follow menus.

In addition to the standard functions, the controller MC28x also allows the control of up to 3 NC axes. Standard stepper motors with their corresponding power supplies are used. The function-possibilities in the manual mode increase and include the following:

- Individual control of all axes in \pm
- Overdrive of all axes
- Teach mode
- Program selection
- Reference point verification
- Parameter adjustment of all axes with comfortable editor

The following functions are available in the automatic mode:

- Automatic program selection, i.e. through:
 - barcode readers, part recognition, external start signal
- Step by step operation
- Power supply supervision

As a further interesting option, the axis controller MC28x allows the integration of a communications interface module. In connection with a specialized modem, all operational conditions can be perceived and evaluated without the need for on site service. In addition, the optimization of axis parameters can be enforced by the communications interface module. With these possibilities, a clearly reduced response time can be guaranteed and in many cases, costly field service can be avoided.

Standard software of the LC controllers

The standard software is a basic structure with the most important software components. It allows a fast and trouble-free set-up of operating process and user interface. In their basic structure the programs are set up the same way, thus also providing many advantages concerning service and remote access maintenance, as all our service engineers are familiar with them - not just a few specialists.

The menu guiding of the LC controllers is also already completely included in the standard program. Manual and automatic mode are available for operation. It is also possible to widen the function range within the operating modes via remote access maintenance, respective screen displays included.

The standard software includes the following modules:

- TP - CPU communication
- Trouble shooting
- Monitoring of limit and read switches
- Touch Panel (TP) menu guide
- Failure indication
- Programmable oiler
- Part counter / cycle time
- Slide table
- Manual mode
 - manual cylinder control
 - direct input/output test
 - menu set-up Touch Panel

With the modular programming we are able to considerably reduce the programming time for standard assembly systems. If a system includes nothing but the modules mentioned before, start-up will normally take no more than a few hours. Another important advantage results from the use of a thoroughly tested program code. Programming mistakes bound to happen with a program of such a size, may thus be considerably cut down or even completely avoided.

The short start-up time was achieved also with the use of a testing software developed by DEPRAG. This software enables even the electronics staff and mechanics to completely check and adjust the assembly system. Another positive aspect is the use of almost identical operating manuals for assembly systems. If applicable, our programmers must only extend information about some special functions in these manuals.

Application examples of the standard software

Check the following small selection of possible screen displays of the standard software for our LC controllers as follows.



Screen display automatic mode, showing important system status, failure information and control elements.



Main menu for selecting more functions.



Example for manual mode showing different signal status.



Program selection for screw driver controller model AST 30.

Technical Data



Screwdriving Controller	type	LC 120	LC 124	LC 156	LC172
standard	order no.	385427 A	349984 A	349984 B	349984 C
power source	V/Hz	230/50 (115/60)	230/50 (115/60)	230/50 (115/60)	230/50 (115/60)
power consumption max.	VA	60	200	200	200
insulation		IP20	IP54	IP54	IP54
display		4 lines	touch-panel 5.7" 320 x 240 dots		
number of inputs		12	14	30	38
number of outputs		8	10	26	34
communication interface		no	optional	optional	optional
programming according to IEC 1131		no	yes	yes	yes
type of display		functions blocks	instruction list / ladder logic / functions blocks		
storage		128 nodes	4 kB	4 kB	4 kB
dimension (W x H x D)	mm	330 x 160 x 290	485 x 235 x 386		
	in.	13x6 ¹⁹ / ₆₄ x11 ²⁷ / ₆₄	19 ³ / ₃₂ x 9 ¹ / ₄ x 15 ³ / ₁₆		
weight	kg/lbs	5 / 11	10 / 22	10 / 22	10 / 22



Screwdriving Controller	type	LC2plus	LC2
standard	order no.	830092	950779 A
power source	V/Hz	400/50 (220/60)	230/50 (115/60)
power consumption max.	VA	2000	2000
insulation		IP54	IP54
display		preferably TP2plus (more on request)	preferably TP2plus (more on request)
number of inputs		32	32
number of outputs		32	32
RS 232 interface		on request	on request
bus systems		profibus DP (more on request)	profibus DP (more on request)
communication interface		optional	optional
programming according to IEC 1131		yes	yes
type of display		instruction list / ladder logic / functions blocks	
storage		512 kB	128 kB
data storage		2 MB	2 MB
integrated NC control		yes	yes
dimension (W x H x D)	mm	600 x 600 x 210	600 x 600 x 300
	in.	23 ⁵ / ₈ x 23 ⁵ / ₈ x 8 ¹⁷ / ₆₄	23 ⁵ / ₈ x 23 ⁵ / ₈ x 11 ¹³ / ₁₆
weight	kg/lbs	32 / 70.4	28 / 61.6

Operator Panel	type	TP2plus
	order no.	803365
Technical Data:		
display		touch-panel 5.7" 320 x 240 dots
colours		256
memory		2048 kB
dimension (W x H x D)	mm/in.	360x350x100/14 ³ / ₁₆ x13 ²⁵ / ₃₂ x3 ¹⁵ / ₁₆
weight	kg/lbs	12.5 / 27.5



Motor Controller	type	MC 281	MC 282	MC 283
for stepper motors	order no.	385432 A	385433 A	385434 A
power source	V/Hz	230/50 (115/60) / 400/50		
power consumption max.	VA	1600	1800	2000
insulation		IP54	IP54	IP54
display		graphic display 240 x 64 dots		
membrane keyboard		yes	yes	yes
number of inputs		16	32	48
number of outputs		16	32	48
RS 232 interface		optional	optional	optional
bus systems		CAN Bus	CAN Bus	CAN Bus
communication interface		optional	optional	optional
programming according to IEC 1131		yes	yes	yes
type of display		instruction list / ladder logic / structured text-language C		
storage		1 MB	1 MB	1 MB
integrated NC control				
for 1 axis		yes	yes	yes
for 2 axes		no	yes	yes
for 3 axes		no	no	yes
max. step frequency	kHz	40	40	40
dimension (W x H x D)	mm/in.	300 x 500 x 500 / 11 ¹³ / ₁₆ x19 ¹¹ / ₁₆ x21 ²¹ / ₃₂		
weight	kg/lbs	40 / 88	40 / 88	40 / 88

Optional Equipment

Mobile Panel

for DEPRAG Controller LC2plus / LC2 and Siemens Simatic S 7-300/400

Mobile Panel consists of: Mobile Panel 177, battery and 5 m connection cable to terminal box Technical Data: Display Memory Dimensions Ø x T Weight	type order no.	MP177 950850 A STN, 256 colours, 5.7 inches 2048 kByte 245 mm x 58 mm 1.3 kg
Terminal Box consists of: terminal box, fixture and 5 m connection cable to PLC	order no.	950850 B
Terminal Box consists of: terminal box, fixture and 10 m connection cable to PLC	order no.	950850 C



Software order no.	type order no.	DCAM MC28x 961917 B	programming kit
Software order no.	type order no.	MC28x 828642	offline programming MS-EXCEL

Teach-panel order no.	type order no.	for MC28x MC 180 TP 385416 A
Technical data: electrical power supply display membrane keyboard RS 232 interface CAN interface dimension (W x H x D) weight	V mm/in. kg/lbs	DC 24 graphic LCD 320 x 240 dots yes yes yes 290 x 320 x 80 / 117 ¹⁶ / ₁₆ x 12 ⁵ / ₈ x 3 ¹ / ₈ 2 / 4.4

additional display to simplify the teach and setup procedures

Data Protection

for DEPRAG Controller LC2plus / LC2 and Siemens Simatic S 7-300/400

Software order no.	type order no.	S7CYCLE Data Read 831992	Software for the cycle acquisition of production data SPS → PC
Software order no.	type order no.	S7CYCLE PLC 832065	Customer specific Software adaptation in the PLC (for oder no. 831992)
Software order no.	type order no.	S7ProPos 832734	Software for managing positions and data (830352 and 827600 not included)
Software order no.	type order no.	Prodave MPI 830352	Communication Port SPS → PC (basis for 831992)
Connector Cable 5m/16.4 ft order no.	type order no.	MPI-S7-300/400 827600	Connection of Data Production to Controller LC2plus and Simatic S7-300/400

Optional Equipment

Remote access maintenance

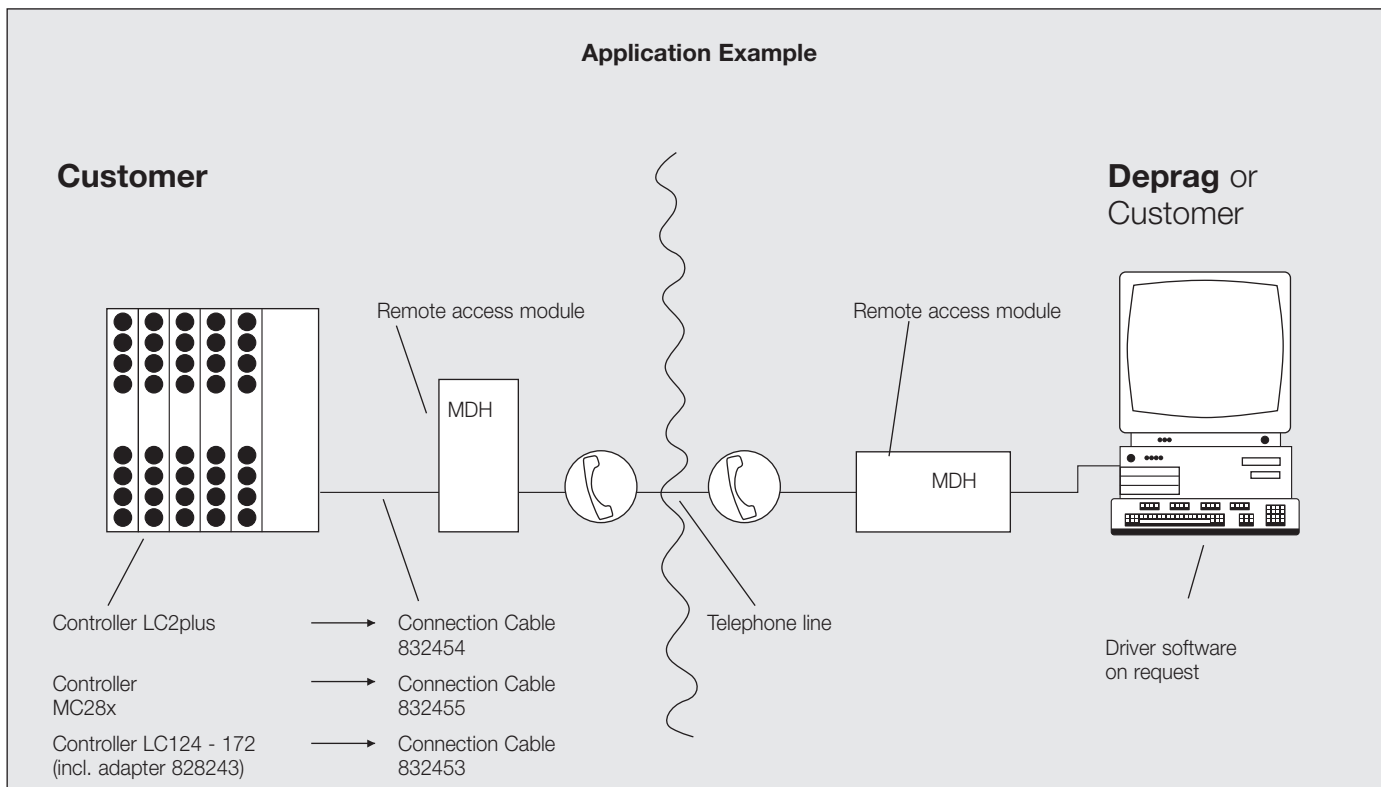
for DEPRAG Controller LC 124 - LC 172, LC2plus / LC2 and MC28x

Suitable for Controller		LC124 / LC 156 / LC172	LC2plus / LC2	MC28x
Remote access maintenance package, cpl.	order no.	385487 A	385488 A	385489 A
Consisting of:				
Remote access maintenance module	order no.	828243	–	–
Connection Cable	order no.	832453	832454	832455
Remote access maintenance modem	order no.	832451	832452	832467
Technical Data:				
Version		Installation into controller housing with din rail mounting bracket	Installation into controller housing with din rail mounting bracket	Installation into controller housing with din rail mounting bracket
Telephone connection		analog	analog	analog
Electrical power supply	V	DC 24	DC 24	DC 24
Dimension (W x H x D)	mm	45 x 101 x 120	45 x 101 x 120	45 x 101 x 120
	in.	1.76 x 3.94 x 4.68	1.76 x 3.94 x 4.68	1.76 x 3.94 x 4.68
Weight	kg	0.22 / 0.48	0.22 / 0.48	0.22 / 0.48
Dial modes		MFV / IWV	MFV / IWV	MFV / IWV

If you order a complete controller together with the Remote access maintenance package, the installation into the controller is included.

The remote access maintenance package is available with DIN rail mounting bracket (for installation into a control box).

A DEPRAG service technician, using the remote access maintenance package through a telephone line, can perform a fast diagnosis or low cost service of the customer's controller. With this remote access maintenance module, trouble shooting diagnosis- and software updates can be performed from any location.



Example

Remote access module MDH connected to the Screwdriving- or Assembly System

The remote access module can be mounted on a DIN rail in the control box and connected with a cable to the PLC used by the customer. The customer has to provide a telephone line, which should be connected to the remote access module (if connected to an ISDN line, make sure to provide a pulse code modulator).


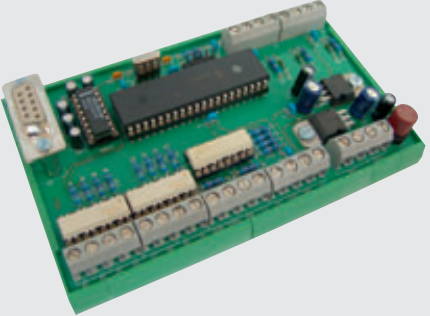

Example

Remote access module MDH on a Service-PC

The remote access module is connected to a telephone line, which enables the module to dial the customer's controller. Additionally, a driver software is required to permit connection to the controller. Drivers for other controllers can be supplied upon request.

Optional Equipment

Identification and Data Archiving for all DEPRAG Controllers

<p>RFID Identbox order no. 385505 A</p>  A white rectangular metal enclosure with a circular cutout on the top surface and a multi-pin connector on the bottom. The DEPRAG logo is visible on the top.	<p>RFID PLC Interface order no. 385483 B</p>  A green printed circuit board (PCB) populated with various electronic components, including a large integrated circuit, resistors, and capacitors. It features a multi-pin connector on one side.	<p>RFID TAG order no. 201829</p>  A small, dark, teardrop-shaped passive RFID tag with a small hole on one end.
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Description:

The RFID Identbox reads the individual numbers from the RFID TAG. In the RFID PLC Interface up to 60 different TAGs can be stored. The TAGs function passively; this means that they have no batteries or other wear.

Application Options:

The RFID system can be used with all DEPRAG controllers and any other PLC controllers. Communication results over digital inputs and outputs (24 Volt).

The following can be realised:

- Operator identification (instead of passwords or keys) for approval of machine functions or to allocate data to specific persons.
- Identification of work piece carriers.
- Identification of tools.

DEPRAG

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CERTIFIED AS PER DIN EN ISO 9001
