

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

DEUTSCHMANN AUTOMATION

LOCON 24-0360-A32I

32-OUTPUT ELECTRONIC CAM CONTROLLER

Used with the applicable LOCON 24 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Deutschmann English LOCON 24/48/64 Instruction Manual V8.9, technical data section16.2; exact suffix decoded from manufacturer cam-control catalog

7 LOCON 24, 48 and 64 options

The following performance features are available as an option for the basic unit:

7.1 Expansion to 32 outputs (LOCON 24 only)

Upgrading from 24 to 32 outputs

7.2 Inputs and logic functions (LOCON 24 and 48 only)

16 inputs for logic gating with outputs. Chapter "Logic functions" contains a detailed description.

7.3 SSI interface

The connection of SSI absolute shaft encoders is supported as an option. Please refer to chapter "Pin assignment X3 (1x6-pin screw terminals)" on page 15 for the pin assignment of the SSI interface.

7.4 Incremental encoder; incremental counting/direction inputs

Optionally, an incremental encoder with any resolution can be connected to LOCON, whereby the limit values specified in the technical data must be observed. 24 V incremental encoders with two 90°-offset tracks A and B are supported, wired in accordance with the chapter Connection elements (INC_TRACK_A, INC_TRACK_B). Moreover, if using an incremental encoder, certain inputs to which the absolute shaft encoder is normally connected are interpreted as status signals. Please refer to chapter 'Signal description' for a more precise description of their mode of operation.

Alternatively, inputs "Encodertrack9" and "Encodertrack10" can be evaluated as counting and direction input by appropriate wiring. One pulse is incremented with each rising edge at "Count". If input "Down+" is at 24 V, down counting occurs. Otherwise, up counting occurs. If "Select-Count+" is not wired or is wired to 0 V, the system expects an incremental encoder with A/B tracks.

7.5 Encoder monitoring (option G)

Optionally, a 'genuine' encoder monitoring is available. It compares the encoder value read in each cycle with the value read in before and generates an Error 105 if a deviation greater than ± 3 increments has been detected for a period equal to eight times the cycle time. This procedure reliably detects a defective encoder or a damaged cable, but brief interferences on the encoder line do not result in an error message.

First of all it is checked, whether the difference between last and current encoder value is $> \pm 3$. If it is less, the encoder value is interpreted as ok and the error counter is decremented by 1, provided that it exceeds 0. In case an encoder deviation $> \pm 3$ inc. was detected, the error counter is incremented by „EncoderErrorStep“ (provided that it is not a zero crossover). Through it an error is weighted more than a good value.

When the error counter reaches 256, the device shows the error 105.

Through this process brief interferences and differences below 3 inc. are ignored, however, a defective encoder or a severely disturbed encoder information is recognized.

The most significant encoder can not be monitored, as the encoder acts as if it was driven back and forth between 0..EncoderHalf, in case the MSB (most significant bit) is defective.

A PLS must shift a programmed cam as a function of the actual encoder speed in order to compensate for this idle time dynamically. This means that a valve which is to open at position 100 must, for example, already be opened at position 95 at a speed of 1 m/s and must already be opened at position 90 at a speed of 2 m/s.

This function is designated dynamic cam shifting or idle time compensation (TZK).

Idle times may be programmed block-serially, i.e. a set idle time always applies to a block of 8 outputs, or bit-serially, which provides the option of choosing different switch-on and switch-off delay times in the case of block-serial TZK.

The setting is made with the following values:

- | | | |
|---|---|--|
| 1 | = | Block-wise idle time compensation |
| 2 | = | Bit-wise idle time compensation |
| 3 | = | Block-wise idle time compensation with separate switch-on and switch-off times |

13.3.1.6 DICNET-device number (GNR)

This parameter can be used to set the device number with which the LOCON logs on to the DIC-NET bus and with which, for example, it is addressed by WINLOC or communicates with TERM 4.

This value can be changed only with the rear-panel DIP switch and not in the menu.

If you use the RS232 interface, this parameter is of no significance.

13.3.1.7 Menu Select language

In conjunction with the integrated operator control panel, it is possible to select the menu language with this parameter.

The following assignment applies:

- | | |
|----------------------|-------------|
| 0 = German (default) | 5 = Flemish |
| 1 = English | 6 = Dutch |
| 2 = French | 7 = Swedish |
| 3 = Italian | 8 = Finnish |
| 4 = Spanish | 9 = Danish |

13.3.1.8 Zero-point offset (only in the case of absolute shaft encoder)

The zero-point offset or zero offset is used to synchronize the machine's mechanical zero point (datum) with the zero point of an absolute shaft encoder. It makes it possible for the encoder to be fitted in any position and means that the mechanical zero point (datum) of the machine does not have to correspond to that of the encoder.

The programmed zero-point offset value is subtracted by LOCON from the actual encoder value, i.e. if the absolute shaft encoder supplies the value 100 as the position and if a zero-point offset of 10 is programmed, LOCON processes the value as if position 90 had been read in.

If an offset towards higher values is to be made, the value to be offset must be subtracted from the encoder resolution and entered as zero-point offset. In the above example, if position 110 is to be processed and an encoder with 1000 information items/rev is connected, a correction value of 990 (1000-10) would have to be entered.

Since zero-point correction generally occurs at the machine datum in practice, it suffices to enter the displayed position value as the correction value (TEACH-IN).

If LOCON is used with an incremental encoder, zero-point correction is not required.

14 Operation via TERM 24

14.1 Fundamentals on TERM 24 and LOCON 24, 48 and 64

(if used as terminal)

A cam control of the LOCON 24, 48 or 64 Series simultaneously provides you with a terminal whose scope of performance corresponds precisely to that of the TERM 24 terminal. This means that you can also use these cam controls for operating other networked Deutschmann units.

The DEUTSCHMANN AUTOMATION product range includes cam controls that can be configured by the customer and cam controls whose configuration must be specified when ordering.

The customer-configurable parameters relate to the following functions (dependent on the particular unit):

- Type of idle time compensation (block-wise, bit-wise, separate switch-on/switch-off idle time)
- Encoder type
- Encoder resolution
- Scaling of the speed display
- Analogue upper range value
- Language

A distinction is made between configuration parameters which define the fundamental mode of operation of the unit and which are normally only defined once and the system parameters (initialisation) which are defined machine-specifically.

Please refer to the description of the connected cam control or the parameter table in chapter "Configuration and initialisation" provided with the relevant unit connected for the precise scope of performance of your unit.

The following sections of this chapter must be noted when programming a cam control of the LOCON and ROTARNOCK series via a TERM 24!

14.2 Main menu TERM 24

You will see the following menu on the liquid-crystal display (LCD) after power-up of the unit:



16.2 Technical data LOCON 24

Characters	Basic equipment	Options
Operating Voltage	✓ 24 Volt DC $\pm 20\%$, max. 0,2A (switched off)	
Data protection	✓ EEPROM (at least 100 years); no battery	☐ Via transfer-program on PC
Programs	✓ 64	
Number of Cams	✓ 1000 cams, optionally distributable to channels and programs; cams are interchangeable linewise	☐ 1500 cams, optionally distributable to channels and programs; ☐ Angle-/time-cam
Zero-point offset	✓ Programmable over the entire range	
Position recording	✓ Absolute encoder Gray-code parallel 24 V; to 13 Bit (2 ... 8192), Gray-code 360, 720, 1000, 3600 and 7200 inf./rev. ✓ Programmable reverse direction of rotation	☐ Incremental encoder, counting area up to 16384, optional A/B-or count-/direction-signal ☐ SSI-encoder up to 13 Bit (2 ... 16384) ☐ Encoder monitoring function ☐ MT: Inc. counting area up to 16777216 SSI up to 24 Bit
Outputs	✓ 48, short-circuit proof, 24 Volt/0,3A, (max. 1A/8 Outputs), plus-switching	☐ Floating Run-control ☐ Lockable outputs ☐ Output change - dependent on the direction of rotation
Inputs	✓ 13 inputs for encoder signals ✓ 6 inputs for channel selection ✓ 1 input program change ✓ 1 input program release	☐ 16 inputs for logic-connection (cycle time increases by 300 μ s + 10 μ s per connection)
Idle time compensation (ITC)	✓ 0 ... 999ms blockwise	☐ 0 ... 999ms blockwise or bitwise ☐ Separate switch-on and switch-off delay at blockwise ITC ☐ Highly-dynamical ITC
Cycle time	✓ 75 μ s (without ITC) ✓ 150 μ s (with blockwise ITC) ✓ 300 μ s (with bitwise ITC) ✓ 350 μ s (with separate switch-on/switch-off ITC)	☐ At MT: 950 μ s + 12 μ s/cam
Programming	✓ Via integrated operating panel with LCD-display with LED-background lighting ✓ Menu multilingual ✓ Teach-In	☐ With external control unit TERM 6, 24, 32 ☐ Offline/online via PC ☐ Via open communication profile
Display	✓ Encoder position and speed (7 section display) ✓ Output display via LED ✓ Speed display scalable ✓ Gear factor	
Interface	✓ RS485 DICNET-network for up to 16 axis ✓ RS232 (switchable)	
Connection	✓ Via screw-plug-connector	
Installation	✓ Frontplate installation	☐ PM-version (without operation front) for DIN-rail mounting
Type of protection	✓ IP54	☐ IP65
Dimensions	✓ 144 x 144 x 44 mm (WxHxD)	☐ 168 x 168 x 44 mm (WxHxD)
Switchgear opening	✓ 138 x 138 mm (WxH) (DIN 43700)	☐ 138 x 138 mm (WxH) (DIN 43700)