Product Manual Ridder LogicDrive RLD80

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Ridder Drive Systems

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1.1 LogicDrive RLD80 product manual

This product manual contains important information for installers on how to connect and commission a Ridder LogicDrive RLD80. All activities in this respect should be carried out by qualified and skilled mechanical and / or electrical installers in proper and safe conditions.



2.1 LogicDrive RLD80 description

The LogicDrive RLD80 is a maintenance-free drive unit for accurately and flawlessly opening and closing air inlet flaps, air valves and ventilation curtains in livestock houses. The RLD80 features a sleek housing with a high protection class of IP65. This not only makes the RLD80 resistant to water and dust, but also easy to clean.

The RLD80 is equipped with a self-locking worm wheel

transmission which ensures that the drive shaft is braked when the drive unit stops moving. The matching gear and worm wheel transmissions mean the drive unit runs very quietly. The RLD80 is available with a one-sided or two-sided drive shaft for mounting one or more belt drums or sprockets. The RLD80 is durable and has virtually no duty cycle restriction.

The RLD80 features a 24 V DC stepper motor with intelligent motor control. Using a 0-10 V control signal, the RLD80 can be positioned extremely accurately. The revolution range of the RLD80 drive unit is electronically adjustable from 0.25 to 100 revolutions of the drive shaft. The integrated motor control unit of the RLD80 protects the drive unit against overloading and adjusts it to a taught-in position in the event that the control signal is lost (requires emergency power supply). The RLD80 is equipped with a contact to transmit alarm signals.

The RLD80 drive unit can be controlled and powered by the Ridder LogicControl RLC100 control units (or equivalent) and Ridder LogicPower RLP200 emergency power supply (or equivalent). This allows the RLD80 to be adjusted to an emergency position should a power failure occur.

The standard RLD80 is finished with a graphite grey powder coating.

2.2 LogicDrive RLD80 application

The LogicDrive RLD80 drive units are designed to adjust the positions of air inlet flaps, air valves and ventilation curtains in livestock houses and crop storage buildings. Other applications require permission by Ridder Drive Systems.

In addition, the following conditions apply when using the LogicDrive RLD80:

- The construction of the RLD80 may not be modified or changed.
- The applicable regulations and guidelines (e.g. CE) must be observed.
- The RLD80 may not be used to lift or move people.







Mechanical	
Torque	80 Nm
Speed	1 rpm
Winch belt speed	15-22 cm/min
Winch belt length	2.5 m
Rotational range between end positions	0,25-100 rev
Drive unit	Self-locking
Dimensions (WxHxD)	110 mm x 150 mm x 230 mm
Weight	9.6-12.1 kg
Electrical	
Supply voltage	24 V DC (± 10 %)
Maximum current	2 A
Power	48 W
Alarm contact	24 V AC/DC, 1 A
Protection	Mechanical and thermal overload
Control	
Control signal	0-10 V DC / 10-0 V DC
Control signal difference (A - B)	> 2 V DC
Emergency position control	
Lower value of control signal	> 1 V DC
Activation signal	< Lower value of control signal x 0.5 V DC
Emergency position (C)	Freely adjustable
	between or to one of the end positions (A, B)
Environment	
Protection class	IP65
Ambient temperature	0-40 °C (32-104 °F)
2.4 LogicDrive RLD80 dimensions	







Winch belt forces depend on:

- Type of LogicDrive RLD80 (one-or two-sided output drive shaft, single or double winch strap).
- The required winding length of the winch belt.

Winding length limitations:

- Pre-winding the winch belt around the drum (± 140 mm for single winch belt, ± 70 mm for double winch belt, see also §3.4).
- Winding capacity of drum (± 2000 mm with single winch belt, ± 1200 mm with double winch belt).

Graph lines:

- 1. RLD80 winch belt pull force per winch belt: One winch drum with a single wing belt (graph line ①).
- 2. RLD80 winch belt pull force per winch belt: Two winch drums with single winch belts (graph line ②).
- 3. RLD80 winch belt pull force per winch belt: One winch drum winch with a double winch belt (graph line ③).



winding length of winch belt (mm)

Belt forces only applicable for opening and closing air inlets and valves! Forces not allowed for lifting or hoisting objects or people!



WARNING

Each LogicDrive RLD80 unit is packaged in a box together with its accessories. The following table shows which items are supplied in each box.

						The second se	RIDEO MAANUMA .	
		507000	507050	591350	591360	416952	265100	265105
507001	RLD80-1-24V\1D25/36	1 x					1 x	1 x
507051	RLD80-1-24V\2D25/36		1 x				1 x	1 x
507301	RLD80-1L-24V\1D25\1B	1 x		1 x	1 x		1 x	1 x
507302	RLD80-1L-24V\1D25\2B	1 x		1 x	2 x		1 x	1 x
507351	RLD80-1L-24V\2D25\2B		1 x	2 x	2 x		1 x	1 x
507400	RLD80-1K-24V\1D25\z16	1 x				1 x	1 x	1 x
507450	RLD80-1K-24V\2D25\z16		1 x			2 x	1 x	1 x

3.1 LogicDrive RLD80 mounting positions

Please observe the following mounting positions when installing the LogicDrive RLD80.





Mount the LogicDrive RLD80 according to the following instructions and in a mounting position as described in §3.1.

1 **CAUTION**



Please ensure that the RLD80 is mounted securely, so that the building structure can sufficiently absorb the forces applied.

When mounting the RLD80, ensure that the motor cover remains accessible so you will have no problems connecting and teaching in the RLD80.



To drill the mounting holes, a drilling template has been included. Use the drilling template to mark the holes onto the wall or structure.

If you do not wish to use the template, mark the holes as shown opposite.



Mounting the unit to a wall (blind holes).

- Drill holes for wedge bolts or sleeves.
 - Secure the unit using the following fasteners:
 (1) M8 x 75 wedge bolt (with washer, spring washer and nut).
 - (2) M8 wedge sleeve (with (3)).
 - (3) M8 x 65 hexagon bolt (with washer and spring washer).



Mounting the unit to a steel structure (through holes).

- Drill ø 8.5 mm holes.
- M8 x 30 hexagon screw (4x).
- M8 self-locking nut M8 (4x).
- M8 body washer (8x).



Mount the belt drum and winch belt (or belts) for the RLD80 as follows:



3.4 Pre-winding the winch belt onto the belt drum

To safely use the belt drum and winch belt of the LogicDrive RLD80, it is necessary to first pre-wind the belt onto the drum:

Belt drum with a single belt:

• At least one revolution.

Belt drum with a double belt:

• At least ½ revolution.



Not pre-winding the winch belt may result in injury at high belt or drum loads.



Mount the triangle and buckle to the winch belt as follows:



3.6 Mounting the sprocket

Mount the sprocket for the RLD80 as follows:





4.1 Connection and operation - abbreviations

Symbol	Description
RLD80	
AIN	0-10 V DC Control signal
С	Emergency Position
DIR A DIR B	Push button for rotational direction A B
GND	Ground (earth) terminal
LED A LED B	LED for rotational direction A B (Green, control board X1)
PROG	Programming button
RELAY	Alarm contact terminal (control board X1)
RUN LED	Status LED for motor board X2 (green)
S1	DIP Switch (control board X1)
X1 X2	Control board Motor board
M1/(M2) - RLC100	
1/(11) - Sgn	0-10 V DC control signal from climate controller
2 /(12) - Gnd	Return wire of control signal from climate controller
3 /(13) - Scr	Shield of control cable
4 /(14) - AL	Alarm signal from LogicDrive
5 /(15) - AL	Return wire of alarm signal from LogicDrive
6 /(16) - Sgn	0-10 V DC control signal to LogicDrive
7 /(17) - Gnd	Return wire of control signal to LogicDrive
8 /(18) - Scr	Shield of alarm and control signal cables
9 /(19) - 24 V	24 V DC LogicDrive power supply
10 /(20) - Gnd	Return wire of LogicDrive power supply

4.2 Connecting the control components and switch materials, and cable lengths

The data in the table below allows you to determine the required conductor diameter, based on the cable length and supply voltage.

Cable	Voltage	Min. conductor diameter	Max. cable length at 24 V DC
Power cable	24 V DC	1.5 mm ²	30 m
		2.5 mm²	50 m
Control cable	0-10 V DC	0.75 mm²	

Note: If longer cable lengths are required, you can consider compensating for the voltage loss by increasing the supply voltage of the LogicDrive RLD80. A conductor diameter of 1.5 mm² requires a 1 V DC increase per 10m of cable length and a diameter of 2.5 mm² requires a 1 V DC increase per 15 m of cable length (both in addition to the relevant value specified in the table).



Please use only suitable control components and switch materials. Make sure you are using the correct equipment by consulting the information of the control components and switch materials.



The LogicDrive requires a supply voltage of 24 V DC ± 10 %.



The diagram below shows how to wire the LogicDrive RLD80. It also shows where the operating elements are located on the control board X1 and the motor board X2.



Always use separate cables for the 24 V DC supply voltage and 0-10 V DC control signal.

ATTENTION

Connect the shield in the control box and NOT in the RLD80!



The figure below shows the control buttons DIR A and DIR B along with the corresponding rotational direction of A and B. The figure also shows where the end and emergency positions are located relative to each other.





The following conditions and criteria apply to teaching in the LogicDrive RLD80:

Control signal	Always use the 0-10 V control signal of the climate controller to teach in the RLD80. The voltage difference of the control signal must be at least 2 V to teach in the RLD80.	A B
Teach-in sequence	You can teach in the RLD80 from end position A to end position B and vice versa.	10 N / 10.02
	The 0-10 V control signal may increase from A to B or from B to A.	A A
Minimum movement	The minimum movement between end positions A and B is 90° (¼ revolution) of the drive shaft.	SS A B A
Emorgonal pacition	To use the emergency position C, the minimum control voltage must be higher than 1 V.	A
Emergency position	The emergency position C must be programmed between or to one of the end positions A or B.	C. B

5.2 Operating the LogicDrive RLD80

Chapter 6 describes how to teach in the LogicDrive RLD80. This section describes the control options for teaching in the RLD80.

Teach-in mode	The DIP switch on the control board X1 allows you to activate the teach-in mode of the RLD80. To do so, adjust the DIP switch in the direction of the control buttons.	1	C C C C C C C C C C C C C C C C C C C	
Operating mode	The DIP switch on the control board X1 allows you to activate the operating mode of the RLD80. To do so, adjust the DIP switch in the direction of the terminal strip.	1	DIP SWITCH	





When operating the LogicDrive RLD80, do not exceed the limit positions to avoid damage or injury!

Hold to run	to run To operate the unit in rotational direction A in		DIR B	DIR A	PROG
Operation DIR A	teach-in mode, press and hold down push button 'DIR A'. If end position A has been programmed, the RLD80 will stop at this position.	1	\odot		\bigcirc
Hold to run	To operate the unit in rotational direction B in		DIR B	DIR A	PROG
Operation DIR B	teach-in mode, press and hold down push button 'DIR B'. If end position B has been programmed, the RLD80 will stop at this position.	1	0	0	\bigcirc
			DIR B	DIR A	PROG
Pulse	To activate pulse operation for rotational direction A, first press and hold down control button 'DIR A', then press the programming button 'PROG' and then release both buttons	1			
Operation	Pulse operation can be stopped at any time	2	\bigcirc		Ö
DIR A	by pressing one of the control buttons. If end position A has been programmed, the RLD80 will stop at this position.				
		3	0	\bigcirc	\odot
			DIR B	DIR A	PROG
Dulas	To activate pulse operation for rotational direction B, first press and hold down control button 'DIR B', then press the programming	1			
Operation	button 'PROG', and then release both buttons.	2			
DIR B	Pulse operation can be stopped at any time		$\mathbf{P}_{\mathbf{q}}$, <u></u> →
	by pressing one of the control buttons. If end position B has been programmed, the RLD80 will stop at this position.	3	0		\odot
			DIR B	DIR A	PROG

Stop pulsePulse operation can be stopped at any time byoperationpressing one of the control buttons.





5.3 LogicDrive RLD80 status LEDs

While the unit is in teach-in or operating mode, you can determine the status of the RLD80 by the LEDs intended for this purpose. These status LEDs are located on the control board X1 (LED A and B) and on the motor board X2 (RUN LED). For more information on the locations of the LEDs, see §4.3. The LED codes are discussed from §6.1 onwards and their meanings are explained in §8.1.



5.4 Control signal of climate controller and emergency position

The table below provides an overview of common control signals of climate controllers. Please note that you must also correctly set up the control unit used (such as the Ridder LogicControl RLC101 or RLC102). To do so, see the manual of the control unit.

To teach in the RLD80, the difference in control signal output of the climate controller (i.e. between the open and close commands) must be at least 2 V. A larger difference is recommended to control the RLD80 more accurately.

To teach in an emergency position, the minimum value of the control signal must be 1 V. If the control signal is lost, the RLD80 will move to the taught-in emergency position. This does, however, require the RLD80 to be powered by a 24 V DC supply voltage (from the mains or an emergency power supply).

Control signal	Description	Emergency position
0-10 V	 The RLD80 is controlled by a 0-10 V control signal. The end positions correspond to 0 V and 10 V. The RLD80 does not detect the loss of the control signal. 	Not possible
1-10 V	 The RLD80 is controlled by a 1-10 V control signal. The end positions correspond to 1 V and 10 V. The RLD80 detects the loss of the control signal. 	Possible
2-10 V	 The RLD80 is controlled by a 2-10 V control signal. The end positions correspond to 2 V and 10 V. The RLD80 detects the loss of the control signal. 	Possible







6.1 Teaching in the LogicDrive RLD80 - Programming the end positions

The following conditions apply to programming the end positions:

- No end position/positions may have been programmed (to erase end positions, see §6.3).
- The RLD80 must be taught in with the control signal of the climate controller!
- The difference in control signal output for both end positions must be at least 2 V.

	Description	Picture
1	Set the DIP switch S1 to 'Teach-in mode'.	
	10 e LED A e e e e e e e e e e e e e e e e e e	
2	Set the control unit of the RLD80, such as the Ridder LogicControl RLC101, to 'Auto' mode.	Ø
3	From the climate controller, send the desired control signal (0-10 V DC) for the end position A to be programmed.	DC VÓLTS
4	Use button 'DIR A' to set the desired end position A. If necessary, use button 'DIR B' to adjust end position A.	DIR B DIR A PROG
	Pulse operation is also possible operation, ensure that the en	e (see §5.2). If you use pulse d position is not exceeded!

To save the selected end position A, first press and hold down the programming button 'PROG' (1) and then press the control button 'DIR A' (2). Release both buttons once the corresponding 'LED A' starts blinking slower (3).







5

6	From the cl signal (0-10 programme	imate controller, send the desired control V DC) for the end position B to be d.	A B
7	Use button If necessary	'DIR B' to set the desired end position B. , use button 'DIR A' to adjust end position B.	DIR B DIR A PROG
8	To save the down the p press the c buttons on slower (③	selected end position B, first press and hold rogramming button 'PROG' (1) and then ontrol button 'DIR B' (2) . Release both se the corresponding 'LED B' starts blinking).	DIR BDIR APROGImage: Strain
	14 🖲 LEC	A	
9	Set the DIP	switch S1 to 'Operating mode'.	
		A	
	4 🖲 LEC	В	

10 End positions A and B have now been programmed.



6.2 Teaching in the LogicDrive RLD80 - Programming an emergency position

The following conditions apply to programming an emergency position:

- End positions A and B must have been programmed (see §6.1).
- The minimum value of the control signal must be greater than 1 V DC.

	Description	Picture			
1	Set DIP switch S1 to 'Teach-in mode'.	1			0
2	Use button 'DIR A' or 'DIR B' to set the desired emergency position C.		DIR B	DIR A	PROG
	Pulse operation is also	possible	(see §5.	2).	
3	To save the emergency position C, press the programming button 'PROG' $(\widehat{1})$. Release the button once both LEDs (i.e. 'LED A' and 'LED B') start blinking alternately in quick succession ($\widehat{2}$).	1 			PROG
	17 e led a				
4	Set the DIP switch S1 to 'Operating mode'.	1			
	4 e led a e led b e e led b e e e e e e e e e e e e e e e e e e				
5	The emergency position has now been programmed.				



6.3 Teaching in the LogicDrive RLD80 - Erasing an end position

The following conditions apply to erasing an end position:

• The end position to be erased (A or B) must have been programmed (see §6.1).



• The blink code for 'LED B' may be different.



To erase end position B, first press and hold down the programming button 'PROG' (1) and then press the control button 'DIR B' (2). Release both buttons once the corresponding 'LED B' starts blinking faster (3).

 DIR B
 DIR A
 PROG

 1
 0
 0
 0

 2
 0
 0
 0

 3
 0
 0
 0



- End position B can be erased while in any position!
- The blink code for 'LED A' may be different.



3 The end position/positions and the taught-in emergency position have now been erased. Re-program the end position/positions and the emergency position (see §6.1 and §6.2).



6.4 Teaching in the LogicDrive RLD80 - Erasing an emergency position

The following conditions apply to erasing an emergency position:

• Emergency position C must have been programmed (see §6.2).



³ If desired, re-program the emergency position (see §6.2, from point 2). If you do not wish to program a new emergency position, proceed with step 4.

 $^{(0)}$

Set the DIP switch S1 to 'Operating mode'.

4			U	 U	U U	U
		🖲 LED A				
	4	🖲 LED B				

5 The emergency position has now been erased.



The LogicDrive RLD80 is equipped with an alarm contact, allowing the RLD80 to relay an alarm condition. The alarm contact is able to switch a 24 V AC/DC current of up to 1 A. While in 'operating mode' the alarm contact will switch under the following conditions:

- A mechanical overload of the RLD80.
- A thermal overload of the RLD80.
- Loss of the 0-10 V DC control signal.

Note: Since the alarm contact always switches in unison with LED B, the alarm contact will switch according to the blink code of LED B while the RLD80 is in 'teach-in mode'.



• Operating mode: Normal operation, no malfunctions.

5	🖲 LED A	
	LED B	

- Operating mode: RLD80 start-up cycle (first 3 seconds).
- Operating mode: The maximum temperature has been exceeded.
- Operating mode: The 24 V DC supply voltage is unstable.



Blink code / Meaning

6	🖲 LED A	
	🖲 LED B	

• Operating mode: A mechanical overload has been detected. The RLD80 can no longer be operated in the rotational direction where the overload has occurred. However, you can reverse the rotational direction of the RLD80.



• Operating mode: 10 minor mechanical overloads have been detected. This has caused the RLD80 to stop. Disconnect the supply voltage to reset the RLD80.



• Operating mode: 10 major mechanical overloads have been detected. This has caused the RLD80 to stop. Disconnect the supply voltage to reset the RLD80.

- Operating mode: End positions A and B have not been taught in yet.
- Teach-in mode: End position B (the RLD80 is in this end position) has been programmed; end position A has not yet been programmed.

10	🖲 LED A	
	🖲 LED B	

• Teach-in mode: End positions A and B have not been taught in yet.



• Teach-in mode: End position B (the RLD80 is not in this end position) has been programmed; end position A has not yet been programmed.

12	🖲 LED A	
	🖲 LED B	

• Teach-in mode: End position A (the RLD80 is in this end position) has been programmed; end position B has not yet been programmed.



Blink code / Meaning

13	🖲 LED A	
	🖲 LED B	

• Teach-in mode: End position A (the RLD80 is not in this end position) has been programmed; end position B has not yet been programmed.

14	🖲 LED A	
	🖲 LED B	

• Teach-in mode: End position B (the RLD80 is in this end position) has been programmed; end position A has also been programmed.

15	🖲 LED A	
	🖲 LED B	

• Teach-in mode: End position A (the RLD80 is in this end position) has been programmed; end position B has also been programmed.

16	🖲 LED A	
	🖲 LED B	

• Teach-in mode: End positions A and B have both been programmed. The RLD80 is in neither of these end positions.

17	🖲 LED A	
	🖲 LED B	

• Teach-in mode: RLD80 is in the pre-programmed emergency position.

18	🖲 LED A	
	🖲 LED B	

• Teach-in mode: The emergency position of the RLD80 has been erased.



Although the LogicDrive RLD80 is essentially maintenance free, it is recommended to regularly check the following while using the RLD80:

- The mechanical condition of the unit (e.g. wear and tear, winch belt or cable and fasteners).
- The taught-in end positions (are they still correct for the system being driven).
- The operation of the emergency power supply when it was used.

10.1 LogicDrive RLD80 troubleshooting

This section describes possible problems and their solutions. If you encounter a problem not listed below, please contact your supplier or the manufacturer.

Problem 1	The LogicDrive RLD80 does not respond to the control signal.		
Observation 1	The RLD80 fails to respond to commands using the 0-10 V DC control signal.		
Cause 1	The RLD80 has not been taught in yet.		
Solution 1	Teach in the RLD80 according to the procedure described in this manual.		
Cause 2	The 24 V DC supply voltage has failed.		
Solution 2	Check the supply voltage and restore it if necessary.		
Cause 3	The RLD80 is not receiving the control signal.		
Solution 3	Check the cables and connections and make sure they are securely fastened.		
Cause 4	The RLD80 has overloaded in a particular rotational direction (blink code 6).		
Solution 4	Check the system and correct the overload that has occurred. Reverse the rotational direction of the RLD80 to cancel the lock function. You will then be able to operate the RLD80 in the rotational direction that was previously locked.		
Cause 5	The RLD80 has experienced multiple overloads (blink code 7 or 8).		
Solution 5	Check the system and correct the overloads that have occurred. Switch off the 24 V DC supply voltage of the RLD80 and switch it back on after about 5 seconds. The RLD80 should now be operational again.		



Problem 2	The LogicDrive RLD80 keeps starting and stopping on receiving a 'fixed' control signal.
Observation 2	The RLD80 continuously moves back and forth in both directions in quick succession.
Cause 1	The control signal from the climate controller is unstable.
Solution 1	Make sure the climate controller is sending a stable control signal; check the connections.
Cause 2	The shield of the control cable has not been connected, making the 0-10 V DC input susceptible to interference from external signal sources.
Solution 2	Connect the shield of the control cable in the control box.
Cause 3	The control cable is not shielded and, therefore, susceptible to interference from external signal sources.
Solution 3	Replace the control cable with a shielded cable and connect the shield in the control box.

10.2 Technical Support

For Technical Support please contact your local After Sales contact person. You will find your local After Sales contact person via our website **www.ridder.com**.

10.3 Environment

End of life products from Ridder Drive Systems must be disposed according to local laws and/ or regulations.



11.1 LogicDrive RLD80 accessories

Item no.	Description	
587101	RLC101-115/230\24V DC\0-10V	Martin California Cali
	Ridder LogicControl RLC101 control unit	e
	for 1 LogicDrive RLD80.	
587102	RLC102-115/230\24V DC\0-10V	A Record
	Ridder LogicControl RLC101 control unit	2. 2
	for 2 LogicDrives RLD80.	
587200	RLP200-24V DC	ALL COLOR
	Ridder LogicPower RLP200 emergency power supply	
	for 1 or 2 LogicDrives RLD80 (requires LogicControl unit).	
507220	MOUNTING SET RLD80	00 00
	Mounting plate with fastening bolts for the RLD80.	
590023	CHAIN COUPLING 1/2\z16\S\B1	
	Chain coupling (weld mounting) for	
	1" tube shaft (ø 33.7mm) for the RLD80.	and the second
590008	BOLTED CHAIN COUPLING 1/2\z16\S\B1	
	Bolted chain coupling (bolt mounting) for	
	1" tube shaft (ø 33.7 mm) for the RLD80.	and the second



This product manual contains tips, notes and warnings of varying degrees of importance. The following list explains what they mean.

TIP	A suggestion to perform an action more efficiently.
ATTENTION	May result in damage or problems if an action is performed incorrectly.
	May result in minor injury if the hazard is not avoided.
WARNING	May result in significant injury, possible death, if the hazard is not avoided.





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