Universal Robots for 2200 Series Conveyors

Service Manual

UR3

UR5

UR10

For other service manuals visit our website at:
www.dornerconveyors.com/manuals-literature

Record Conveyor Serial Number Here

851-897 Rev. A

Table of Contents

Dorner Mfg. Corp. has worked directly with Universal Robots to develop software to control 2200 Series conveyors using the Universal Robot controller. The UR controller requires the installation of a software file referred to as URCap. URCap makes the integration of Dorner conveyors easier for customers to setup configure and control. The Dorner conveyor URCap can be downloaded from our website, https://www.dornerconveyors.com/dorner-ursolutions.

Once installed in the UR controller, the conveyors can be added to the control program being created and allow the user to program the inputs and outputs needed for starting, stopping, speed reference, and status information (see **Figure 1**).

The Dorner URCap has been designed for both CB series and e-series controllers.

Programming for the variable speed drive should be done using the Frequency Inverter Operating Instructions manual.

Robot programming manual will be supplied with robot or can be found at the Universal Robots site https://www.universal-robots.com/.

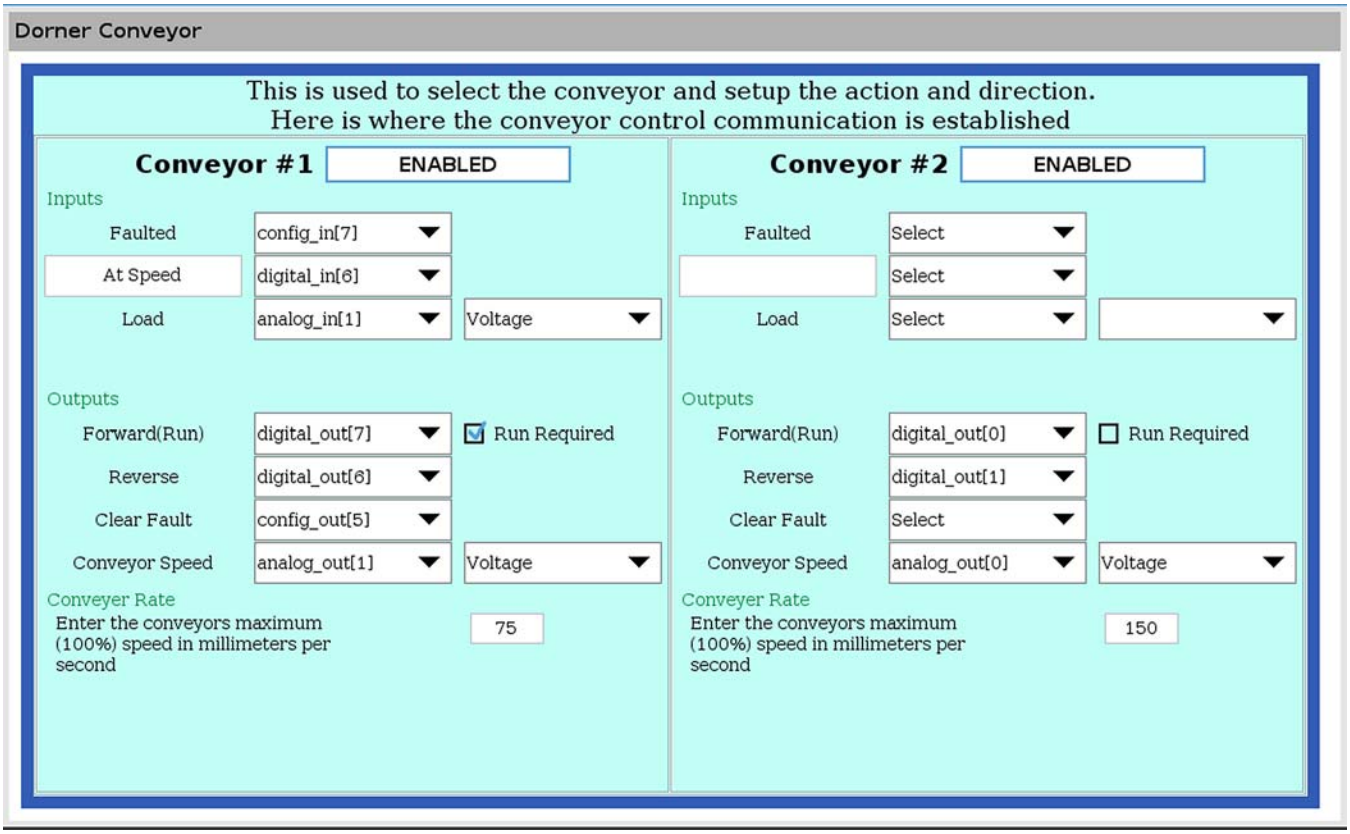


Figure 1

Warnings – General Safety

⚠ WARNING

The safety alert symbol, black triangle with white exclamation, is used to alert you to potential personal injury hazards.

⚠ DANGER

SEVERE HAZARD!

KEEP OFF CONVEYORS. Climbing, sitting, walking or riding on conveyor will result in death or serious injury.

⚠ WARNING

SEVERE HAZARD!

LOCK OUT POWER before removing guards or performing maintenance. Exposed moving parts can cause serious injury.

⚠ WARNING

BURN HAZARD!

DO NOT TOUCH the motor while operating, or shortly after being turned off. Motors may be HOT and can cause serious burn injuries.

⚠ WARNING

PUNCTURE HAZARD!

Handle drive shaft keyway with care. It may be sharp and could puncture the skin, causing serious injury.

⚠ DANGER

EXPLOSION HAZARD!

- **DO NOT OPERATE CONVEYORS IN AN EXPLOSIVE ENVIRONMENT. The electric gearmotor generates heat and could ignite combustible vapors.**
- **Failure to comply will result in death or serious injury.**

⚠ WARNING

CRUSH HAZARD!

- **DO NOT place hands or fingers inside the conveyor while it is running.**
- **DO NOT wear loose garments while operating the conveyor. Loose garments can become caught up in the conveyor.**
- **Failure to comply could result in serious injury.**

⚠ WARNING

CRUSH HAZARD!

- **SUPPORT CONVEYOR SECTIONS PRIOR TO LOOSENING STAND HEIGHT OR ANGLE ADJUSTMENT SCREWS.**
- **Loosening stand height or angle adjustment screws may cause conveyor sections to drop down, causing serious injury.**

⚠ WARNING

SEVERE HAZARD!

- **Dorner cannot control the physical installation and application of conveyors. Taking protective measures is the responsibility of the user.**
- **When conveyors are used in conjunction with other equipment or as part of a multiple conveyor system, CHECK FOR POTENTIAL PINCH POINTS and other mechanical hazards before system start-up.**
- **Failure to comply could result in serious injury.**

Setup and Installation

1. Download Dorner URCap from https://www.dornerconveyors.com/dorner-ursolutions.
2. Load file DornerConveyor-1.x.x.urcap onto a memory stick.
3. Plug memory stick into USB port on Universal Controller teach pendant (see **Figure 2**).

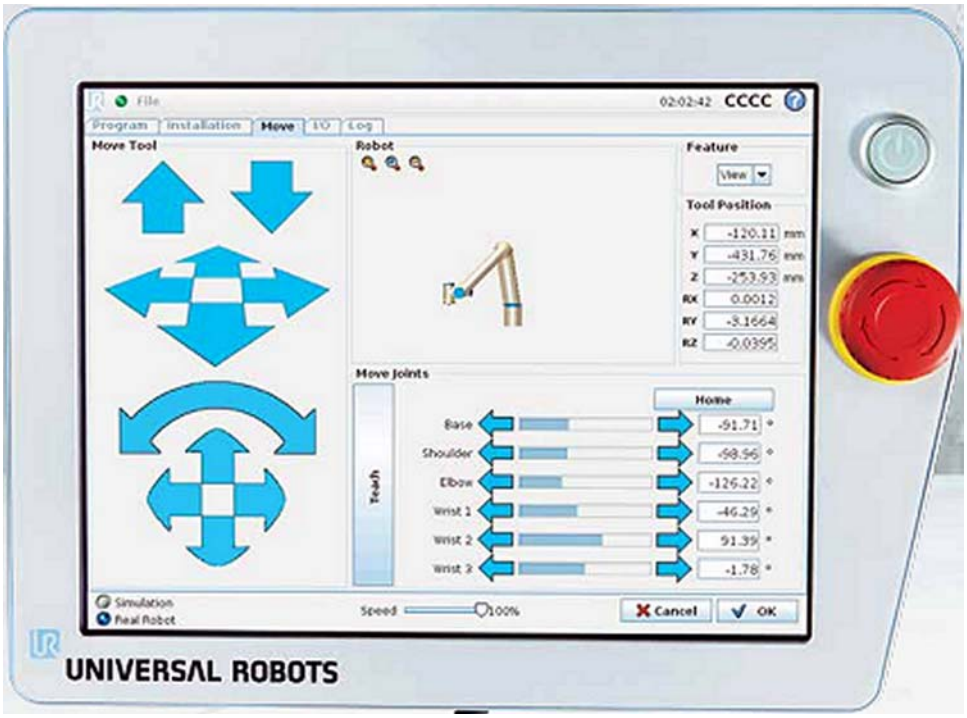


Figure 2

4. Follow URCap installation process in the Setup Robot section of programming:
   a. Click the **+ button** to install the Dorner URCap. Click the **- button** to uninstall.
   b. Select the **DornerConveyor-1.x.x.urcap** file and click open
   c. The URCap will be opened and returned to the setup screen
   d. When installing or uninstalling a URCap, a restart is required. Press Restart.
5. The URCap is now installed.

Status of the URCap in the setup screen:

Symbol	Meaning
1 	URCap ok: Installed and running
2 	URCap fault: The URCap is installed but unable to start. Contact Dorner Mfg. Corp.
3 	URCap restart needed: The URCap has been installed and needs to be restarted

Programming with the Dorner URCap

The installation is capable of controlling 1 or 2 Dorner conveyors. Enable each conveyor to be used, configure the inputs and outputs that will be used to control the variable frequency drive, and the scaling for the speed reference.

Installation Node

Enable the conveyors for use:

- Enable conveyor 1 and/or conveyor 2 to be used with the Universal Robot (see **Figure 3**).

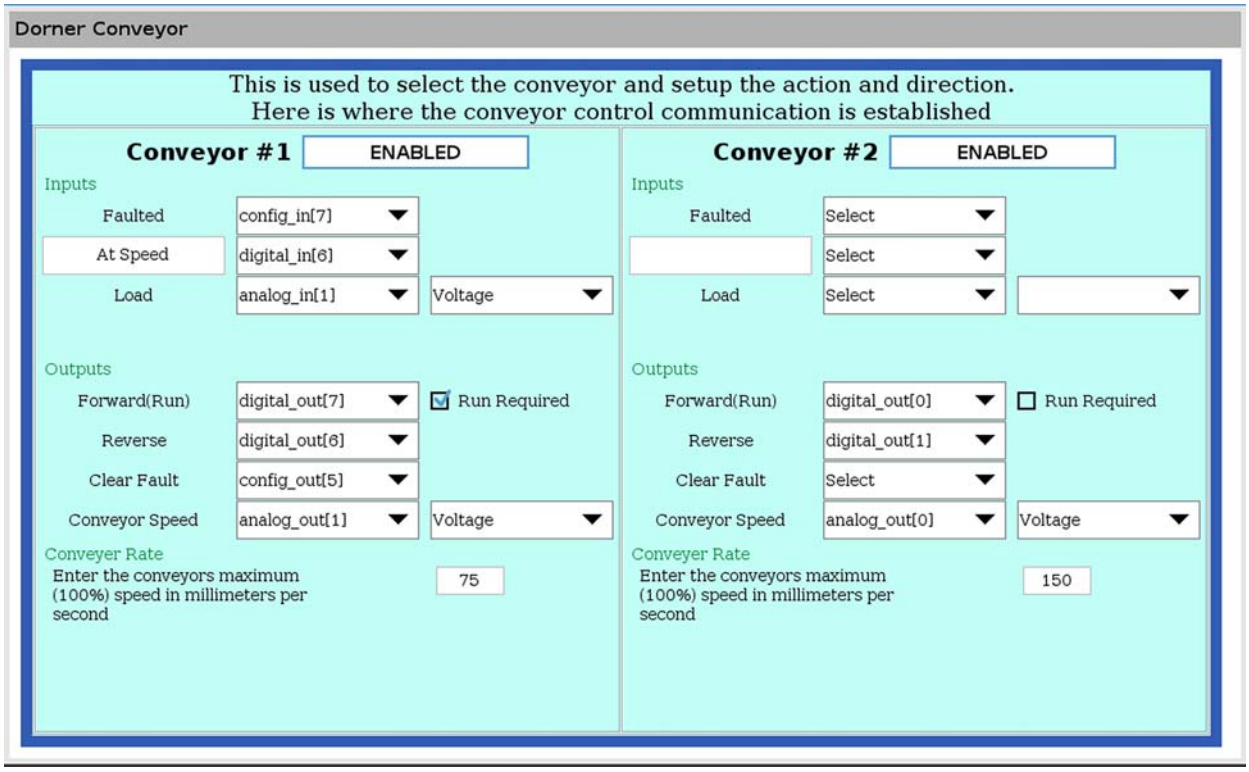


Figure 3

Inputs

Configure the inputs that the controller will receive from the variable frequency drive. These inputs are application dependant:

- **Faulted** - input to the controller from the VFD signaling that it has faulted
- **At Speed** - input is configurable to controller from the VFD signaling a status programmed in the VFD using the relay output
- **Load** - input is an analog signal from the drive for the amount of load. This can be torque or current where 0-100% will equal 0-10V or 0(4)-20mA

Outputs

Configure the outputs that the controller will send to the VFD:

- **Forward (Run)** - output to the VFD signaling it to start/run
- **Reverse** - output to the VFD signaling it to run reverse
- **Clear fault** - output to the VFD signaling it to clear a fault on the VFD when present
- **Conveyor Speed** - analog output that can be configured for 0-10V DC or 0(4)-20mA as the speed reference for controlling the speed of the conveyor motor
- **Conveyor Rate** - is used for scaling the speed reference and should be the conveyors maximum speed in millimetres per second
- **Run Required Check Box** - this check box is used when both the Start/Run and the Reverse signals are required at the same time in order for the VFD to control the motor in the reverse direction

Programming Conveyor Nodes

When adding the conveyors to the program structure, the following window allows the user to program which conveyor needs to be inserted into the logic at that point. Select **Conveyor #1** or **Conveyor #2** and the desired control for the VFD.

NOTE: This is an empty program node - not set up yet (see **Figure 4**).

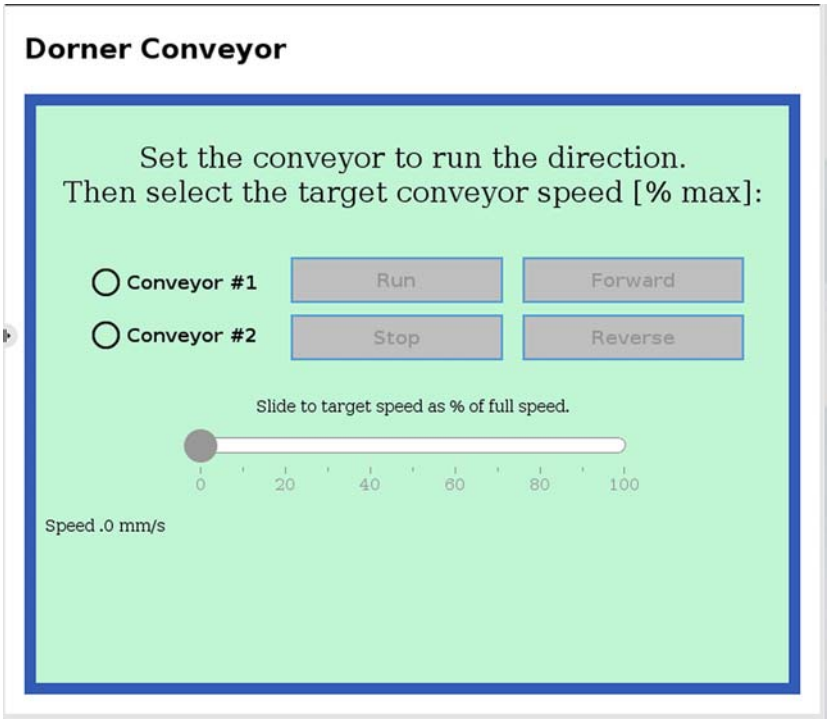


Figure 4

NOTE: This is a completed program and program node (see **Figure 5**). Highlighted program node is displayed in right side of image. Text in program node identifies the action to be performed.

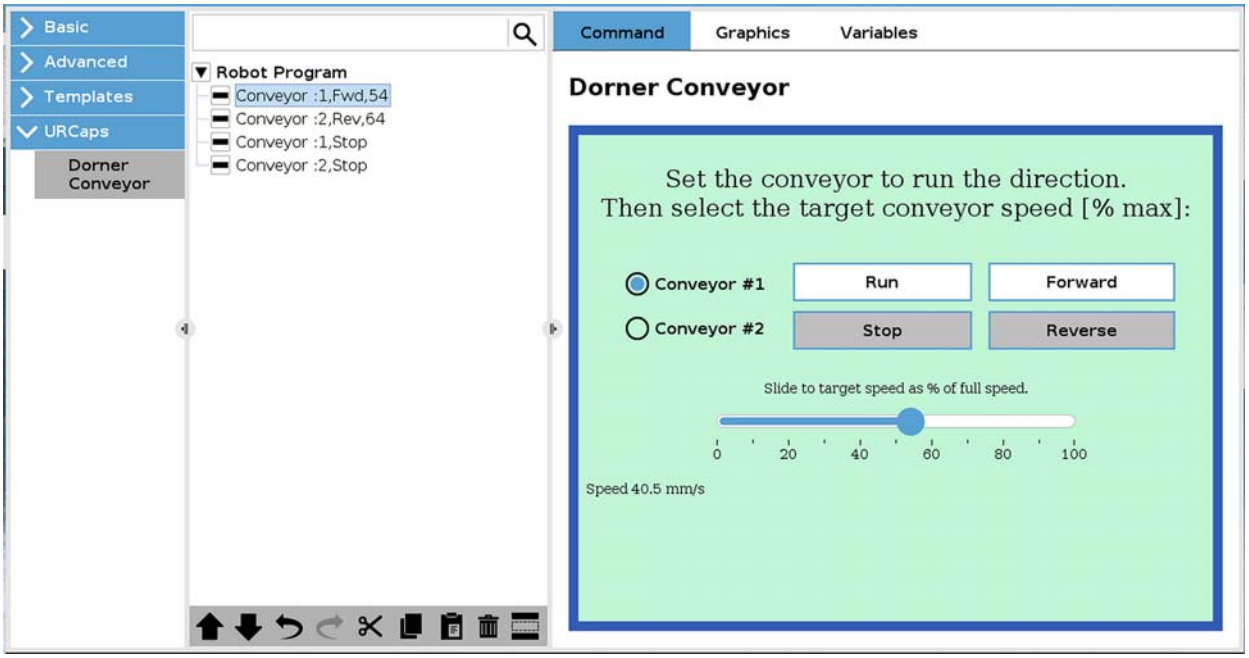


Figure 5

Programming with the Dorner URCap

Toolbar

In the e-series controller, a toolbar for Dorner conveyors is available at the top of the screen (see **Figure 6**).

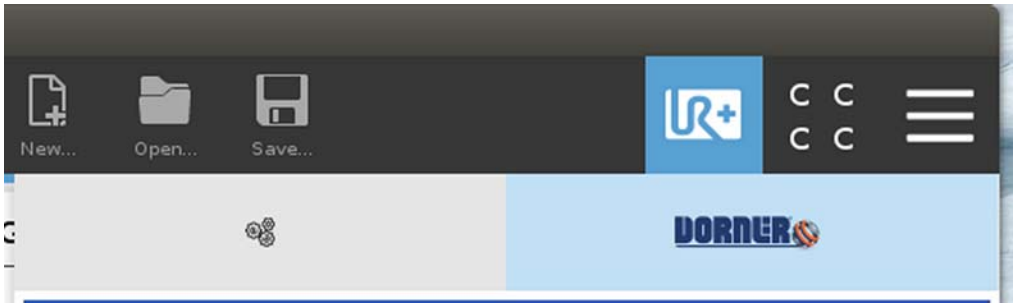


Figure 6

When pressed, the toolbar brings up the Dorner conveyor status page that allows the user to see the fault status, speed, load, and if needed, jog the motor in a forward or reverse direction (see **Figure 7**).

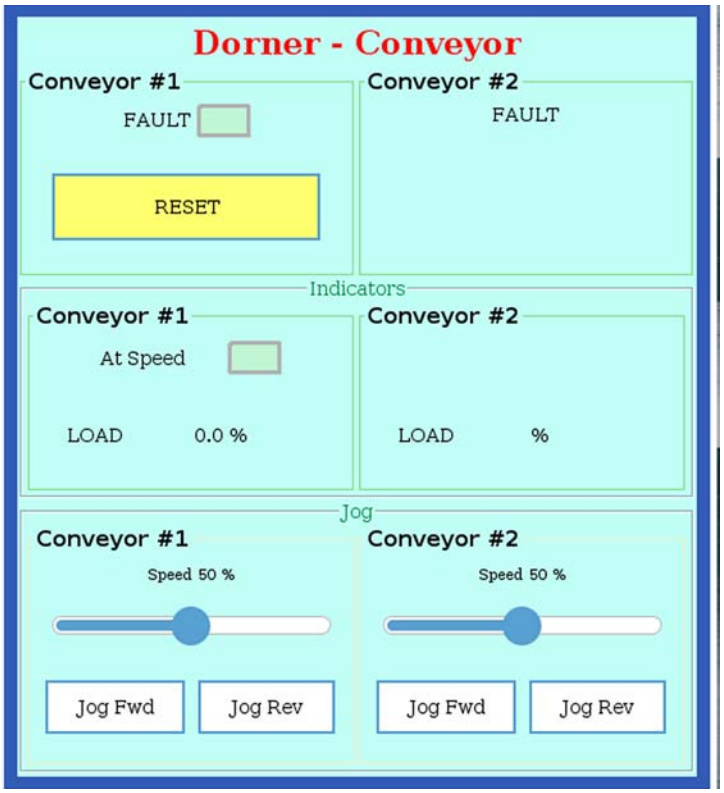


Figure 7

NOTE:

1. Fault & fault reset are available, as they are configured in the installation tab.
2. Option “At Speed” is set up by choosing what output is configured from the VFD to the controller.
3. Load displays percent of load configured by terminal 30 and P150 in the VFD.
4. Jog section is only enabled when the program is not running. Conveyors will move at the speed selected as long as the button is pressed.

For Universal Robots with CB series controllers, the loading, programming and control are the same as the e-series. The screens may look different due to the screen size difference. The CB series does not have the Dorner URCap toolbar functionality (see **Figure 8**).

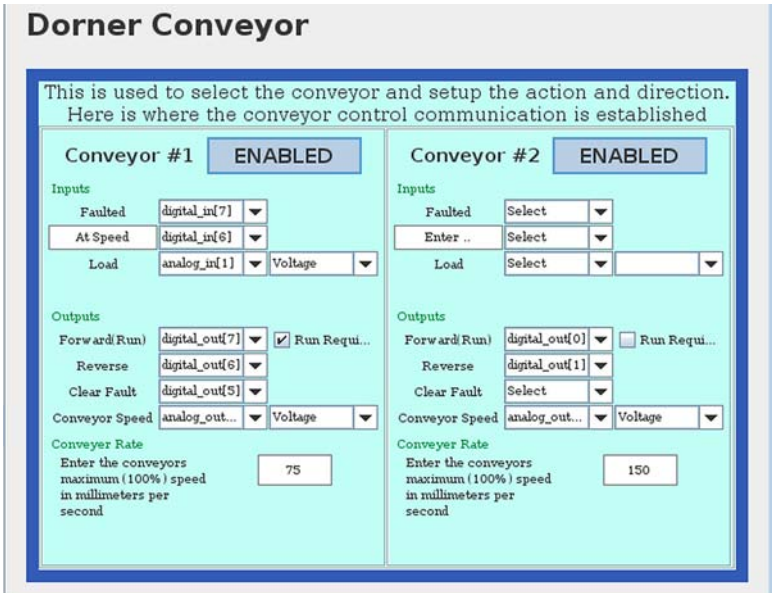


Figure 8

NOTE: This is an empty program node - not set up yet (see **Figure 9**).

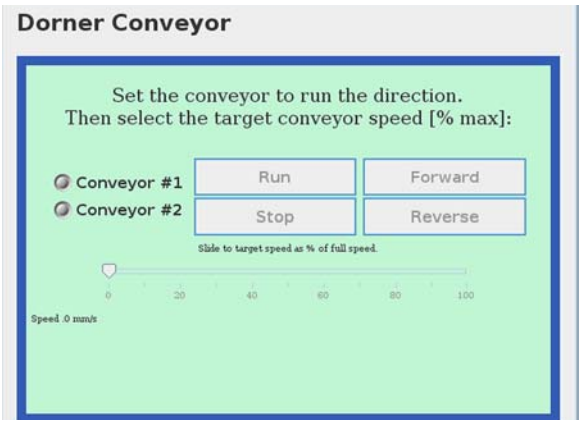


Figure 9

NOTE: This is a completed program and program node. Highlighted program node is displayed in right side of image. Text in program node identifies the action to be performed (see **Figure 10**).

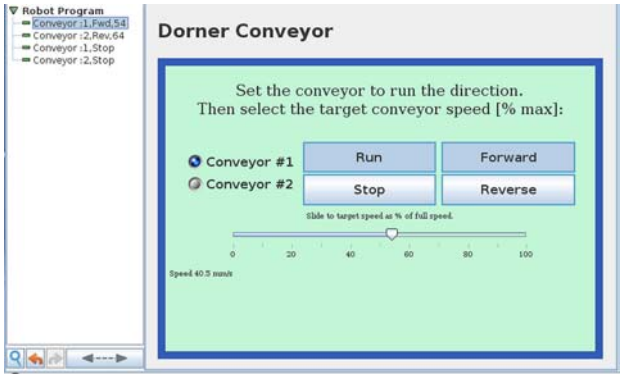


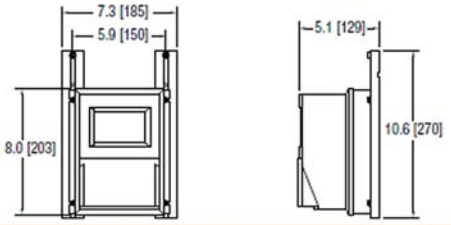
Figure 10

Dorner Full Feature Variable Frequency Drive

Variable Speed Controllers

Chart B VFD Controller, Full CE Compliance

- VFD control
- IP 65 enclosure
- EMC filter
- Variable speed
- Mounting hardware
- Line cord and motor cord
- Motor cord only on 460V



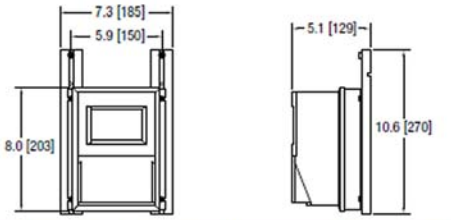
Regulatory Approvals

Part Number	Input Volts	Input Phase	Input Hz	Output Volts	Output Phase	Max Kw*	Max Amps	Reversing
62UV2121(0)	230	1	50	230	3	0.75	4.2	Yes
62UV4341(0)	400	3	50	400	3	0.75	2.1	Yes
62UV2127(0)	230	1	50	230	3	1.50	6.8	Yes
62UV4347 (0)	400	3	50	400	3	1.50	3.4	Yes

(0) = Optional M12 Accessory Port No Option = No Accessory Port E = M12 Port wired for End Stop Photo Eye Application I = M12 port wired for Index Photo Eye Application
Note: E or I options will work with Dorner Control Stop or Jog Button Accessories

Chart D Full Feature VFD Controller

- Full feature VFD control
- NEMA 4 enclosure
- Digital display
- Keypad with Start/Stop, Forward/Reverse and speed variations
- Includes cord to motor
- Power to controller by others
- 62MV1122 includes line cord to controller
- Mounting hardware



Regulatory Approvals

Part Number	Input Volts	Input Phase	Input Hz	Output Volts	Output Phase	Max Hp	Output Amps*	Reversing
32MV1122(0)	115	1	60	230	3	0.5	2.2	Yes
32MV2122(0)	230	1	60	230	3	0.5	2.2	Yes
32MV1121(0)	115	1	60	230	3	1.0	4.0	Yes
32MV2121(0)	230	1	60	230	3	1.0	4.0	Yes
32MV2127(0)	230	1	60	230	3	2.0	6.8	Yes
32MV2322(0)	230	3	60	230	3	0.5	2.2	Yes
32MV2327(0)	230	3	60	230	3	2.0	6.8	Yes
32MV4341(0)	460	3	60	460	3	1.0	2.0	Yes
32MV4347(0)	460	3	60	460	3	2.0	3.4	Yes

In order for this drive to meet full CE requirements for European application a separate CE approve RFI filter must be installed. Product shown in chart B above have this filter pre-installed and are recommended for use in the European Union.

(0) = Optional M12 Accessory Port No Option = No Accessory Port E = M12 Port wired for End Stop Photo Eye Application I = M12 port wired for Index Photo Eye Application
Note: E or I options will work with Dorner Control Stop or Jog Button Accessories

Figure 11

Drive Programming

Parameters:

P100	1 Terminal Strip Control
P101	1 - 10V DC
P112	1 Fwd/Rev
P121	10 Reverse Rotation
P122	20 Clear Fault
P140	4 Inverse Fault
P142	6 At Speed
P150	1 - 10V DC Load

NOTE: This is an example. Inputs, outputs, and programming can be changed based on application.

Figure 12

Wiring Diagram

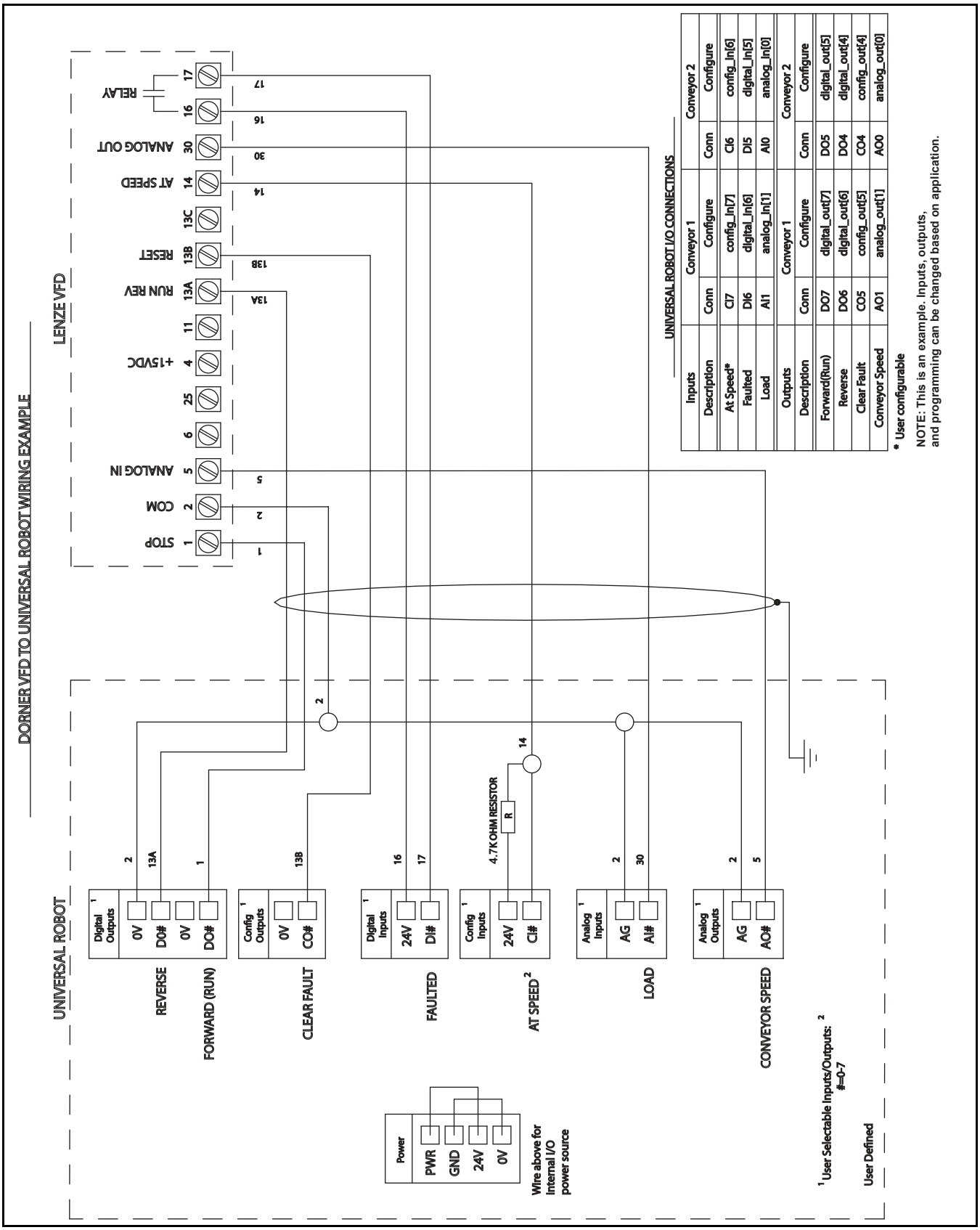


Figure 13

Wiring Examples

Dorner Full Feature Variable Frequency Drive European Version

Frequency Converter

Chart A Variable Speed Frequency Converter, Full CE Compliance

- Adjustable Speed, 20 to 70 Hz
- IP 54 Enclosure
- Digital Device
- Adjustable Start and Stop
- Adjustable timing generator built in
- Control by external signals via free inputs
- Integrated motor protection
- Includes standard plug for 230V, 50 Hz, 1 Phase

Regulatory Approvals

CE

Part Number	Input				Output		
	Volts	Phase	Hz	Watts	Volts	Phase	Watts
KT103342	230	1	50	250	230	3	90
KT200350	230	1	50	250	230	3	180
KT103343	230	1	50	446	230	3	370

Figure 14

DC1
Variable Frequency Drive

Figure 15

Drive Programming

Parameters:

P-12	0 Control Signal Terminals
P-15	8 DI1 Start, DI2 Fwd/Rev
P-16	0 - 10V DC
P-18	3 Error Message (Not Ready)
P-25	9 Output Current

NOTE: This is an example. Inputs, outputs, and programming can be changed based on application.

Wiring Diagram

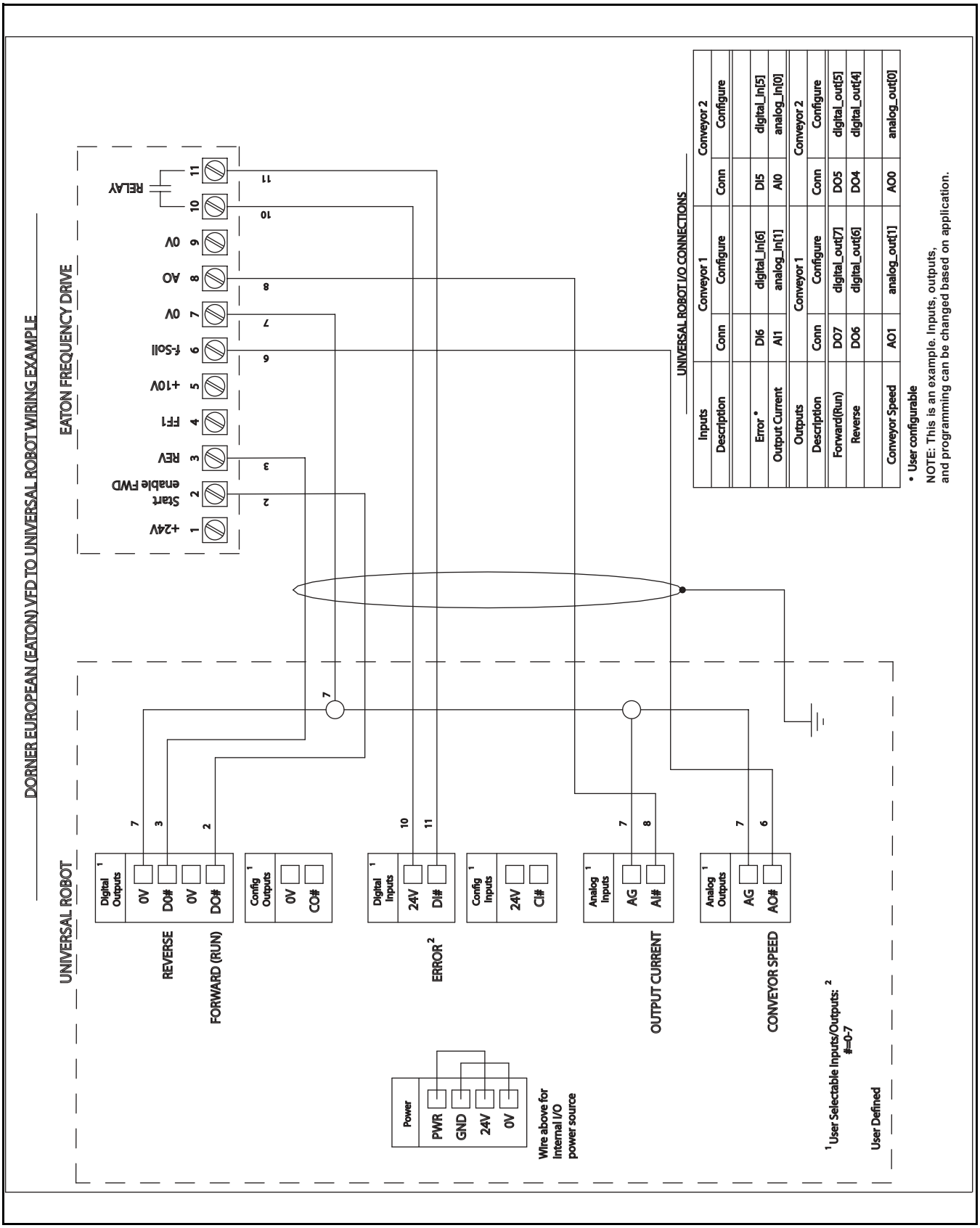


Figure 16

Return Policy

Returns must have prior written factory authorization or they will not be accepted. Items that are returned to Dorner without authorization will not be credited nor returned to the original sender. When calling for authorization, please have the following information ready for the Dorner factory representative or your local distributor:

1. Name and address of customer.
2. Dorner part number(s) of item(s) being returned.
3. Reason for return.
4. Customer's original order number used when ordering the item(s).
5. Dorner or distributor invoice number. Include part serial number if available.

A representative will discuss action to be taken on the returned items and provide a Returned Materials Authorization (RMA) number for reference. RMA will automatically close 30 days after being issued. To get credit, items must be new and undamaged. There will be a return charge on all items returned for credit, where Dorner was not at fault. It is the customer's responsibility to prevent damage during return shipping. Damaged or modified items will not be accepted. The customer is responsible for return freight.

<table>
<tr><td></td><td colspan="9">Product Type</td></tr>
<tr><td></td><td colspan="8">Standard Products</td><td>Engineered to order parts</td></tr>
<tr><td>Product Line</td><td>Conveyors</td><td>Gearmotors & Mounting Packages</td><td>Support Stands</td><td>Accessories</td><td>Spare Parts (non-belt)</td><td>Spare Belts - Standard Flat Fabric</td><td>Spare Belts - Cleated & Spec. Fabric</td><td>Spare Belts - Plastic Chain</td><td>All equipment and parts</td></tr>
<tr><td>1100 Series</td><td colspan="6" rowspan="7">30% return fee for all products except:
50% return fee for conveyors with modular belt, cleated belt or speciality belts

All Electrical items are assigned original manufacturers return policy.</td><td colspan="2" rowspan="11">non-returnable</td><td rowspan="11">case-by-case</td></tr>
<tr><td>2200 Series</td></tr>
<tr><td>3200 Series</td></tr>
<tr><td>Pallet Systems</td></tr>
<tr><td>FlexMove/SmartFlex</td></tr>
<tr><td>GAL Series</td></tr>
<tr><td>All Electrical</td></tr>
<tr><td>7100 Series</td><td colspan="6" rowspan="4">50% return fee for all products</td></tr>
<tr><td>7200/7300 Series</td></tr>
<tr><td>AquaGard 7350 Series Version 2</td></tr>
<tr><td>GES Series</td></tr>
<tr><td>AquaGard 7350/7360 Series</td><td colspan="9" rowspan="2">non-returnable</td></tr>
<tr><td>AquaPruf Series</td></tr>
</table>

Returns will not be accepted after 60 days from original invoice date. The return charge covers inspection, cleaning, disassembly, disposal and reissuing of components to inventory. If a replacement is needed prior to evaluation of returned item, a purchase order must be issued. Credit (if any) is issued only after return and evaluation is complete.

Dorner has representatives throughout the world. Contact Dorner for the name of your local representative. Our Customer Service Team will gladly help with your questions on Dorner products.

For a copy of Dorner's Warranty, contact Dorner, an authorized sales channel or visit our website: www.dorner.com.

For replacement parts, contact an authorized Dorner Service Center or the factory.

www.dorner.com

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