Digitax ST-Z

NEW

Internal EZMotion Module

The Digitax ST-Z (EZMotion) drive provides a very high level of control by allowing the user to create complete user programs to sequence the motion control along with other machine functionality. The Digitax ST-Z can be used to solve the most complex motion applications and still be easy-to-use because of the PowerTools Pro configuration software. PowerTools Pro uses simple point-and-click, drag-and-drop and fill-in-the-blank views that make setup a snap.

User programs are created using a text based motion language that is as easy to read as it is to program. If you don't know the command, just drag it in from the drop down box and PowerTools Pro will assist you with the syntax. With intuitive software and plenty of online help, programming this servo drive is easy; in fact it's **"Motion Made Easy!"™**

See PowerTools Pro in the Software section for examples of this easy to use program. The examples provided range from simple to advanced applications.

- **200-230 VAC or 380-460 VAC input voltage**
- **Internal SM-EZMotion module**
- **PowerTools Pro configuration software** FREE Software
- **2 Solution Module (SM) slots for optional Feedback, Comunications or I/O modules**
- **Safe Torque Off / Drive Enable Input**
- **3 Bi-Directional Input/Outputs**
- **7 Dedicated Inputs**
- **2 Dedicated Outputs**
- **1 Relay Output**
- **1 High Resolution Analog Input, 16 bit + sign**
- **2 Standard Analog Inputs, 10 bit + sign**
- **2 Analog Outputs ±10 VDC, 10 bit**
- **Buffered Encoder Output**
- **Universal Encoder Input, supports 14 feedback types**
- **Optional Resolver Input with SM Resolver module**
- **Optional Keypad**
- **RS485 Serial Port, Modbus RTU**

POWERFUL SOFTWARE FEATURES!

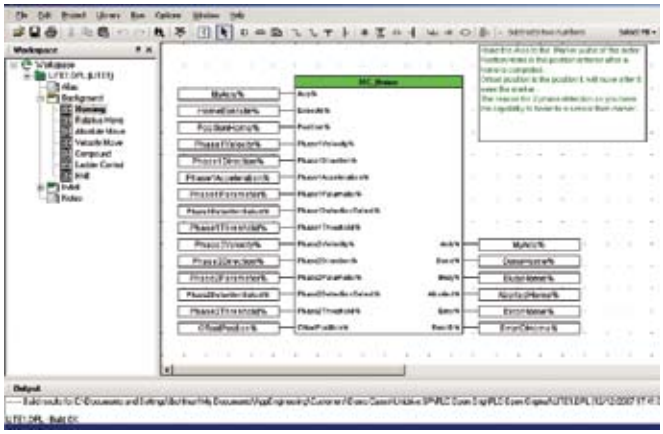
Digitax ST-Z has many powerful software features to meet the most demanding servo application while maintaining ease of use. Complete machine control is now possible with the drive's motion, I/O and communications capabilities.

- Virtual Master - Provides a programmable clock signal for many drives to follow, eliminating mechanical jitter from following a physical axis.
- Modbus Master - Provides drive-to-drive and expanded I/O control with the built in master. The drive is not limited to onboard I/O. Communications to other Modbus slave devices is possible.
  - Multiple drives can share I/O over the networks
  - Stop/Start control such as VFD driven conveyors
  - Use low cost slice I/O to add digital and analog I/O
- Real-Time Programs - Provides deterministic program cycle times for controlling I/O and scheduling program tasks.
- Torque Mode - Switch seamlessly from position or velocity mode into torque mode and back for unlimited flexibility and control for nut running and torque controlled clamps or grippers or any other controlled torque application.
- Electronic Camming - Electronic cams provide unlimited motion profiles to accomplish servo replacement of rigid mechanical cams. Use the internal time base to create a motion profile for custom indexing.

Digitax ST-P
Programmable Motion

NEW

The Digitax ST–P (Plus) features a full functionality motion controller, optimized for high performance machine cells requiring drive-to-drive networking and precision synchronization. The motion and communications are configured within a flexible IEC61131-3 software development environment using PLCopen function blocks. Fieldbus, Ethernet and I/O connectivity enable interfacing with other automation components and Intellectual Property protection ensures that your valuable knowledge remains secure.



- **200-230 VAC or 380-460 VAC input voltage**
- **Internal SM Applications Plus module**
- **SyPTPro motion programming software**
- **2 Solution Module (SM) slots for optional Feedback, Comunications or I/O modules**
- **Safe Torque Off / Drive Enable Input**
- **3 Bi-Directional Input/Outputs**
- **5 Dedicated Inputs**
- **2 Dedicated Outputs**
- **1 Relay Output**
- **1 High Resolution Analog Input, 16 bit + sign**
- **2 Standard Analog Inputs, 10 bit + sign**
- **2 Analog Outputs ±10 VDC, 10 bit**
- **Buffered Encoder Output**
- **Universal Encoder Input, supports 14 feedback types**
- **Optional Resolver Input with SM Resolver module**
- **Optional Keypad**
- **CTSoft configuration software**
- **RS485 Serial Port, Modbus RTU**

POWERFUL SOFTWARE FEATURES!

Digitax ST-P (Plus) offers all of the features available on the indexing drive together with more advanced motion functionality including cam profiling and synchronized motion. Onboard drive-to-drive networking links multiple axes and enables true distributed control. The drive is commissioned using CTSoft, an intuitive drive configuration software that is included free with every drive. The advanced motion features are configured using PLCopen motion function blocks within Control Techniques SyPTPro automation development environment.

On-board position controller ensures superior performance and reduced panel space. Digitax ST-P is configured using Control Techniques market leading development environment, SyPTPro. Standard IEC61131-3 languages, multi-tasking and PLCopen motion function blocks increase familiarity and reduce the development time. SyPTPro can protect your Intellectual Property by downloading only the compiled binary version of your software (not the source code) therefore preventing your customers and competitors from accessing your work. Many machinery users have different site standards for PLCs. This presents you with the challenge of designing standard machine sections that are independent of your customers PLC preference. With on-board intelligence, drive-to-drive synchronization and a wide range of network communication options, Digitax ST makes it easy for you to standardize your designs while retaining full connectivity to any PLC.

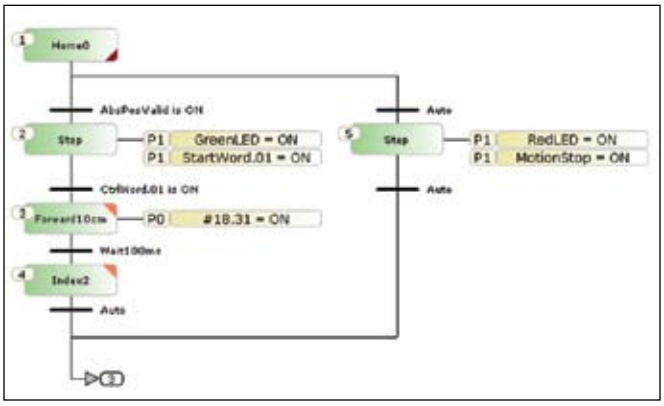
Digitax ST
Software

CTSoft for Digitax ST Base and Digitax ST Indexer

Digitax ST Base and Indexing drives use CTSoft, the Control Techniques drive configuration tool used to commission, optimize and monitor most Control Techniques AC and DC drives.

CTSoft uses wizards to simplify commissioning, manages data stored on the SmartCard, and has robust and graphical tools for monitoring and trouble shooting.

CTSoft also incorporates the industry-standard Sequential Function Chart language for configuring the Digitax Indexer.

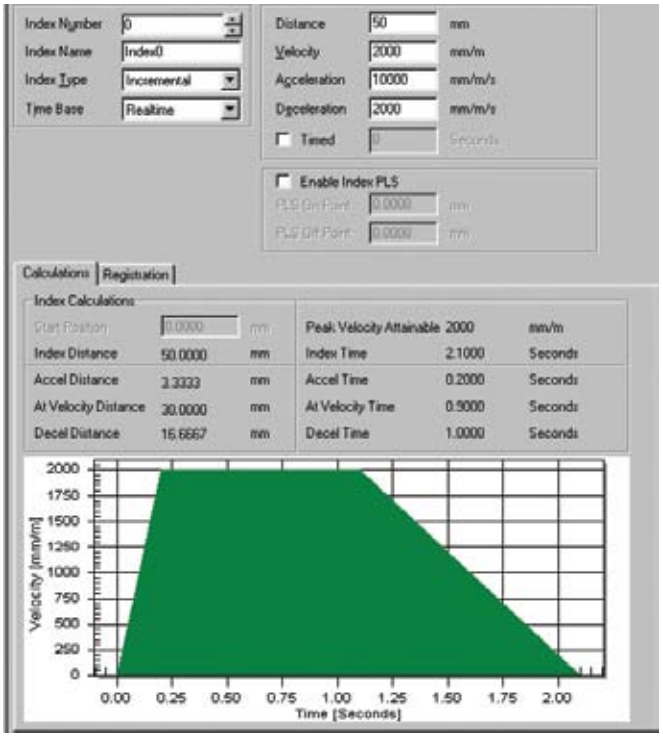


CTSoft Sequential Function Chart with Digitax ST-B and Digitax ST-I

PowerTools Pro "Motion Made Easy"™ software for Digitax ST EZMotion

Developing servo applications with Control Techniques "Motion Made Easy" PowerTools Pro is a simple "five step, top-down process," all displayed within an intuitive Windows™ explorer-like environment—Setup (hardware), I/O Setup, Motion, Programs, and Network.

Although not every step may be needed to create a motion program, each step is configured using simple check boxes, drop down menus, and point-and-click, drag-and-drop operations. A straight-forward text programming language can also be used for custom motion and machine control sequences.



PowerTools Pro with Digitax ST-Z

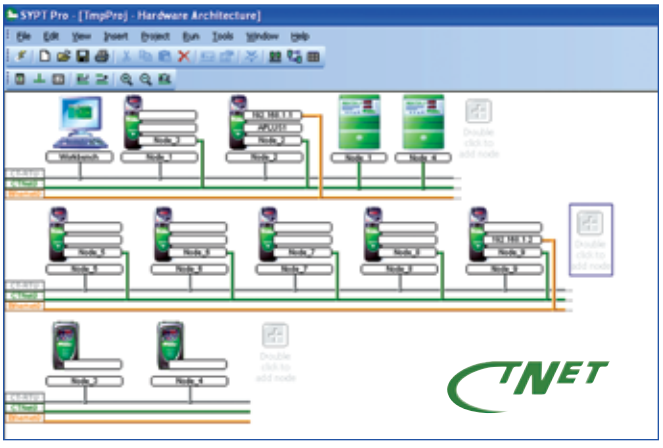
SyPTPro for Digitax ST Plus

SyPTPro is a full-featured, IEC-61131-3-compliant automation development environment that can be used for developing solutions for single or multiple axis applications.

The programming environment supports four industry standard languages: PLC Open, Function Block, Ladder and Structured Text.

CTNet, a high-speed, drive-to-drive network links the drives, SCADA and I/O together form an intelligent networked system, eliminating the need for a PLC and its additional overhead.

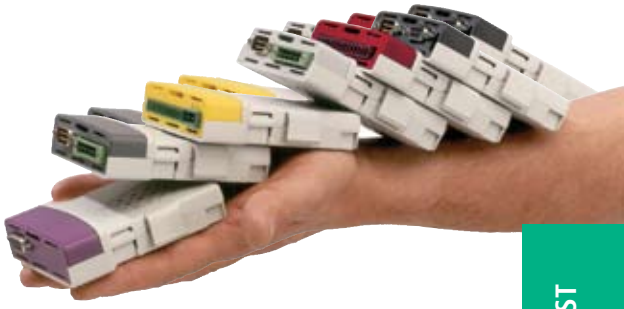
See the Software Section of the catalog for complete software details.



SyPTPro with Digitax ST-P

See page 381 for complete CTNet integration details.

Digitax ST Options



DIGITAX ST OPTIONS AT-A-GLANCE

Options & Accessories	Description	Order Code
Drive Configuration, Programming and Indexing For details see the AC Drives Options & Accessories section	Cloning and Parameter Storage	SMARTCARD-64
	Configuration Software & Indexing	CTSOFT
	Motion Made Easy Programming	POWERTOOLSPRO
	Ladder and Function Blocks	SYPTLITE
	IEC 61131-3 (Ladder, FB, and Text Based)	SYPTPRO
	Communications Cable - RS232/485	CT-COMMS-CABLE
	Communications Cable - USB	CT-USB-CABLE
	Keypad to Drive Cable	SP-LCD-485-XXX
Operator Interfaces	LED Keypad	DST-KEYPAD See page 394 for keypad details
	LCD Keypad	SM-KEYPAD-PLUS (remote mounted only)
	Programmable HMI Panels	See the Options & Accessories section
Power Accessories	Zero-Space Brake Resistor	SM-HEATSINK-DBR0
	E-Stop Duty Braking Resistor	See the Options & Accessories section
	Cyclic Duty Braking Resistor	See the Options & Accessories section
Environmental Protection	Internal EMC Filter	Standard
	External EMC Filters	See the Options & Accessories section
Feedback Solution Modules For details see the Unidrive SP Options section	Universal Encoder Feedback SM-UNIVERSAL ENCODER PLUS	SM-UNI-ENCODER
	Incremental Encoder Input SM-ENCODER PLUS	SM-ENCODER-PLUS
	Incremental Encoder Input & Output SM-ENCODER OUTPUT PLUS	SM-ENCODER-OUT
	Resolver Feedback	SM-RESOLVER
	Screw Terminal Connector	SM-ETC
I/O Solution Modules For details see the AC Drives Options & Accessories section	Extended Analog and Digital I/O	SM-I/O-PLUS
	Extra I/O with Encoder Reference	SM-I/O-LITE
	32 Point Digital I/O	SM-I/O-32
	Extra I/O with RealTime Clock/Calendar	SM-I/O-TIMER
	120/240 Volt AC I/O	SM-I/O-120V
	Double Insulated Extended I/O	SM-I/O-PELV
	Remote Network I/O	See the Options & Accessories section
	24 Volt Protected I/O	SM-I/O-24V
	High Speed Capture & Registration	SM-REGISTER
Communications Solution Modules For details see the Connectivity section	Modbus RTU Follower	Standard
	Modbus RTU Master	Standard (Digitax ST Plus)
	DeviceNet	SM-DEVICENET
	PROFIBUS DP	SM-PROFIBUS-DP
	Ethernet (Modbus TCP/IP, Ethernet IP)	SM-ETHERNET
	Interbus-S	SM-INTERBUS
	CANopen	SM-CANOPEN
	CAN Interface	SM-CAN
	Ethernet (EtherCAT)	SM-ETHERCAT
	SERCOS	SM-SERCOS
	CTNet	Standard (Digitax ST Plus)
	CTSync	Standard (Digitax ST Plus)

DIGITAX ST TERMINALS AND PINOUTS

RS485

Pin Number	Signal
1	120Ω Termination resistor
2	RX TX
3	Isolated OV
4	+24V (100mA)
5	Isolated OV
6	TX Enable
7	RX/ TX/
8	RX/ TX/ (if termination resistors are required, link to pin 1)
9	Isolated 0V

Terminal 1

Pin Number	Signal
1	0V common
2	External 24 VDC
3	0V common
4	10 VDC source
5	Analog 1 +
6	Analog 1 -
7	Analog 2
8	Analog 3
9	Analog Out 1
10	Analog Out 2
11	0V common

Terminal 2

Pin Number	Signal
21	0V common
22	24 VDC Output, selectable
23	0V common
24	I/O 1
25	I/O 2
26	I/O 3
27	Input 4
28	Input 5
29	Input 6
30	0V common
31	Safe Torque Off, Drive enable

Terminal 3

Pin Number	Signal
41	Status Relay
42	Drive OK

Buffer Encoder Output

Pin Number	Signal		
	Quadrature	Freq/ Dir	FWD REV
1	A	F	F
2	A/	F/	F/
3	B	D	R
4	B/	D/	R/
5	Z*		
6	Z/*		
7	n/c		
8	n/c		
9	n/c		
10	n/c		
11	n/c		
12	n/c		
13	n/c		
14	0V		

(Bottom View)

Power

Pin Number	Signal
1	Brake
2	Brake
3	48 VDC+
4	48 VDC-
5	L1
6	L2
7	L3

Z Personality Terminals

Pin Number	Signal	
1	0V Common	
2	Input 1	High Speed Capture Inputs
3	Input 2	
4	Input 3	
5	Input 4	
6	Output 1	
7	Output 2	

P Personality Terminals

Pin Number		
TB1	1	0V RS485
	2	RX/
	3	RX
	4	TX/
	5	TX
TB2	6	A
	7	Shield
	8	B
TB3	9	0V Digital I/O
	10	Input 0 **- Freeze Input**
	11	Input 1
	12	Output 0
	13	Output 1

Encoder Input

Pin Number	INC	ABS	PULSE
1	A	Cos	F
2	A/	Cosref	F/
3	B	Sin	D,R
4	B/	Sinref	D/,R/
5	Z	Data	Z
6	Z/	Data	Z/
7	U	n/c	U
8	U/	n/c	U/
9	V	n/c	V
10	V/	n/c	V/
11	W	Clock	W
12	W/	Clock	W/
13	+V	+V	+V
14	0V	0V	0V
15	thermister	thermister	thermister

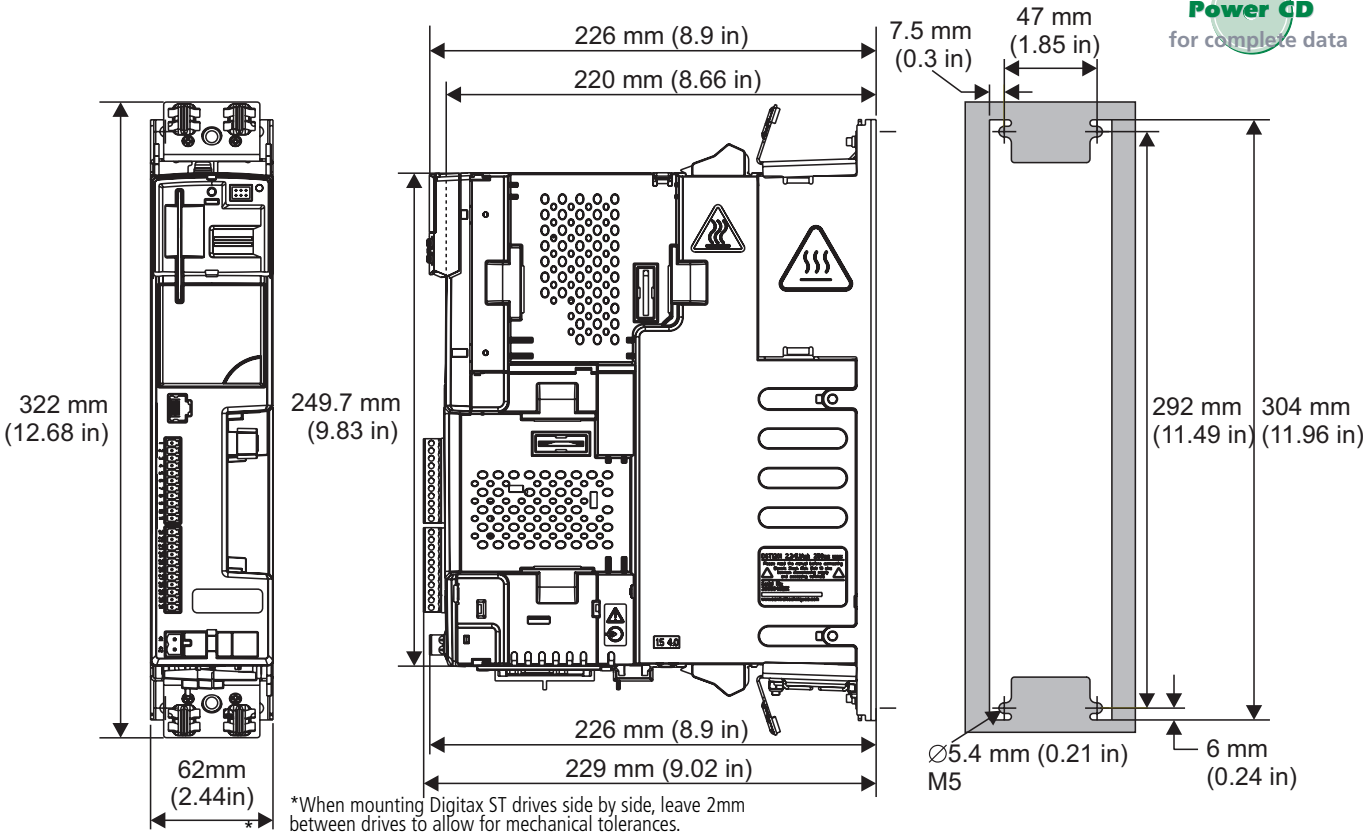
Encoder pin out function is controlled by Pr3.38 see manual for details.

Motor Power

Pin Number	Signal
1	U
2	V
3	W
4	DC Bus +
5	DC Bus -

DIGITAX ST SPECIFICATIONS AND DIMENSIONS

Go to **Power CD** for complete data



*When mounting Digitax ST drives side by side, leave 2mm between drives to allow for mechanical tolerances.

Drive Model Number	Input		Output Current*	
	Voltage Ø	Peak A	Cont. A	Peak A
DST1201	200-230 3Ø	3.5	1.7	5.1
DST1202	200-230 3Ø	7.3	3.8	11.4
DST1203	200-230 3Ø	9.4	5.4	16.2
DST1204	200-230 3Ø	13.4	7.6	22.8
DST1401	380-480 3Ø	2.8	1.5	4.5
DST1402	380-480 3Ø	4.3	2.7	8.1
DST1403	380-480 3Ø	6	4	12
DST1404	380-480 3Ø	8	5.9	17.7
DST1405	380-480 3Ø	9.9	8	24

230/480 VAC @ 6 kHz for rated performance.

*Peak current is duty cycle limited.

Power Requirements

AC Input Voltage: Model dependent: nominal 200-230 or 380-460 VAC 48-65 Hz, ±10%

Switching Frequency 6-12 kHz

System Efficiency 93%

Cooling Method Internal Fan

Drive Control Inputs

Analog, High Precision (1) +/-10 VDC, 16 bit + sign

Analog, General Purpose (2) +/-10 VDC, 0-20 mA, 4-20 mA, 10 bit + sign

Digital (3-6): Selectable. 10-30 VDC, 6 kOhm, Sinking/Sourcing

Safe Torque Off/Drive Disable: Certified EN954-1 Cat. 3

Digitax Z Additional Inputs

Digital (4): 15-30 VDC, 6 kOhm, Sourcing

Digitax P Additional Inputs

Digital (2): 24 VDC, 6 kOhm, Sourcing

Drive Control Outputs

Analog, General Purpose (2) +/-10 VDC, 0-20 mA, 4-20 mA, 10 bit + sign

Digital (0-3): Selectable, 24 VDC, 200 mA total, Sinking/Sourcing

Relay (1): Drive OK contacts, 2A @240 VAC, 4A @30 VDC Resistive load, 0.5A @24 VDC Inductive load

Digitax Z Additional Outputs

Digital (2): 10-30 VDC, 20 mA, Sourcing

Digitax P Additional Outputs

Digital (2): 24 VDC, 20 mA, Sourcing

I/O Supply: 24 VDC ±10%

200 mA max including all digital I/O. Can be switched on or off to act as a fourth digital output

Encoder Output

Quadrature, Quadrature w/ Marker Pulse/Direction, Pulse/Pulse. EIA485 Differential, 512 kHz max, +/-14 VDC

Serial Interface

1 RS-485 Modus RTU, 9600-19.2 k Baud

Digitax P Additional Communications

CTNet and EIA RS485

Environmental

Rated Ambient Temperature: 32-122° F, Derate output above 104° F

Maximum Altitude: 0-9900 ft. Derate output power by 1% per 330 ft over 3300 ft.

Vibration: Tested in accordance with I EC60068-2-29-6/64

Mechanical Shock: Tested in accordance with IEC60068-2-29

Electromagnetic Immunity: Complies with EN61800-3 (2nd Environment)

Electromagnetic Emissions: Complies with EN61800-3 (2nd Environment) with onboard filter. EN61000-6-3 and EN61000-6-4 with optional footprint EMC filter.

Humidity: 95% non-condensing at 104° F

Ingress Protection: IP-20

Weight: 4.4 lbs

HOW TO ORDER

Use one of the next few pages to configure a basic Digitax ST system by selecting one item from each of the four ordering columns, and the fifth column if you are choosing a brake motor. Note that item ❷ motor selection requires additional input as to flange, and on NT systems, connector type. (See the Motor Order String boxes for details.) Items ❸ through ❺ require cable lengths to be provided. The basic systems represented on these pages can be customized with a variety of components depending on your needs. A guide to Digitax ST Options and Accessories can be found at the end of this section.

SELECT SYSTEM AND MOTOR

❶ Select the Digitax ST drive appropriate to the needs of your application and operating environment, either DST-B (Base), DST-I (Indexer), DST-Z (EZMotion) or DST-P (Plus) and the voltage and current ratings.

❷ Select a motor for your drive. The system selection matrix for FM, NT and XV standard motors can be found on the following pages.

CABLE ORDERING OPTIONS

Motor power, feedback and brake cables are fully shielded with connectors and are available in standard and custom lengths. For more information on these and other cables, *see Options and Accessories section*.

Standard lengths of 5, 15, 25, 50 and 100 feet are available from stock. Non-standard lengths require additional lead time. ***Note: Equivalent FM Motor cable lengths are in meters.***

Feet=xxx or meters=yyy with specified lengths. Example: 005 = 5 feet. For applications involving continuous flexing, flexible cables are available. Cable components such as connector kits and raw cable are also available. See Options and Accessories section for details or consult factory for special requirements.

❸ Motor Power Cable Example;
CMDS-xxx 16 AWG for 2-3" motors; connector on motor end, ferrules on drive end

❹ Motor Feedback Cable Example;
UFCS-xxx Connectors on both ends.

❺ Motor Brake Cable Example;
CBMS-xxx Required for motors with brake option; connector on motor end only.

Software

The Control Techniques SM-EZMOTION CD (CT-EZMOTION-CD) is shipped with every product. Software updates are free and can be downloaded from our web site, as are firmware updates.

Note: Digitax (ST-B, ST-I) Base and Indexer drives use CT Soft (free software), Digitax ST-Z EZMotion drive uses PowerTools Pro (free software) and Digitax ST-P Plus drive uses SyPTPro (licensed software).

DIGITAX ST OPTIONS AND ACCESSORIES

Control Techniques provides a complete array of options and accessories to complete your system. For details, see the Options and Accessories section of the catalog.

Brake Relay
BRM-1

Breakout Boards/Cables
SM-ETC

Communications Accessories
ETH-S4, ETH-PATCH-xxx, CT-COMMS-CABLE, CT-USB-CABLE

External Shunt/Resistor
DBR-0

EMC Filters
230V 1Ø = 4200-6000
230V 3Ø = 4200-6001
460V 3Ø = 4200-6002

Synchronization Encoders
SCSLD-4, SCSLD-4R

Operator Interface
CTVue

Extended Warranty
Extends Two Year Warranty to Five Years

Digitax ST Order String