

Predefined Tags in PowerFlex 520-series and Kinetix 5100 Drives

With Connected Components Workbench software version 21 or later, when Kinetix 5100 and PowerFlex 520 series products are added into the Micro800 controller (with firmware revision 21 or later) project under the Ethernet-Module tree, predefined tags are made available in the Connected Components Workbench software to help you program the logic easily.

The Input and Output assembly are shown here for your convenience. While you can directly manipulate these assemblies, they rely on your logic to operate correctly, including timing, pre-existing drive conditions, and so on. It is typical to use the predefined Motion Operation UDFBs to perform motion operations.

Table 43 - Kinetix 5100 Motion Drive Input Assembly Data

Name	Data Type	Description	Value	Comment
InfoBits	SINT			
InfoBits.0	BIT	Indicates whether the drive is in run mode.	0 = Drive is idle 1 = Drive is in run mode	RunMode
InfoBits.1	BIT	Indicates whether the connection is faulted.	0 = Connection is not faulted 1 = Connection is faulted	ConnectionFaulted
InfoBits.2	BIT	Indicates whether the diagnostic is active.	0 = Diagnostic is not active 1 = Diagnostic is active	DiagnosticActive
DiagnosticSequenceCount	SINT	The sequence count for the diagnostic.		
DataBits	SINT			
DataBits.1	Bit	Indicates whether the drive is in a faulted state.	0 = No Fault 1 = Faulted	Fault
DataBits.2	BIT	Indicates whether the data validity is questionable.	0 = Data is valid 1 = Date validity is questionable	Uncertain
StatusBits	SINT	Indicates whether the drive is in a warning state.	0 = No warnings 1 = Drive is in a warning state	
StatusBits.1	BIT	Indicates whether the motor is enabled.	0 = Motor is not enabled 1 = Motor is enabled	WarningPresent
StatusBits.2	BIT	Indicates whether the motor is ready to be enabled.	0 = Motor is not ready 1 = Motor is ready	Active
StatusBits.3	BIT	Indicates whether the drive received the command from the controller.	Indicates that the new command has been received by the K5100 drive. It toggles between 0 and 1 after a new command has been received by the K5100 drive. When this bit toggles, it stays at the toggled state until a new command is received.	Ready
StatusBits.4	BIT	Indicates whether the drive completed the home operation.	1 = Drive completed the home operation	CommandInProgress
StatusBits.5	BIT	Indicates whether the motor is stopped.	1 = Motor is stopped	HomedStatus
StatusBits.6	BIT	Motor actual at reference (position, speed, torque) based on mode.	1 = Motor actual at reference (position, speed, torque) based on mode	Stopped
StatusBits.7	BIT			AtReference
OperatingMode	SINT	Indicates the drive operation mode.	-128...-1 = Reserved 0 = Mode not specified 1 = Position mode 2 = Speed mode 3 = Home mode 4 = Torque mode 5 = Gear mode 6 = Index mode 7...127 = Reserved	
ActiveIndex	SINT	Indicates the currently executing index (PR).	-128...-1 = Reserved 0 = PR 0: Homing 1...99 = PR 1...PR 99 100...127 = Reserved	
MotorType	SINT	Indicates which type of motor is connected to the drive.	0 = No motor connected 1 = Rotary motor connected 2 = Linear motor connected	
ActualSpeed	DINT	Motor actual velocity.	A valid value in RPM.	
FaultCode	INT	Fault code.	For more information, see the Kinetix 5100 EtherNet/IP Indexing Servo Drives User Manual, publication 2198-UM004 .	
WarningCode	INT	Warning code.		

Table 43 - Kinetix 5100 Motion Drive Input Assembly Data (Continued)

Name	Data Type	Description	Value	Comment
ActualPosition	DINT	Actual position of the motor.	PUU (counts or user units)	
ActualTorque	DINT	Actual torque of the motor.	% motor rated torque	
ParamterMonitor1Value	DINT	Parameter monitor selection 1.	0 = No parameter is selected 0x0001...0xFFFF = returned value that is mapped from KNX5100C Function List > Parameter Editor > StatusMonitor ID060	
ParamterMonitor2Value	DINT	Parameter monitor selection 2.	1 = No parameter is selected 0x0001...0xFFFF = returned value that is mapped from KNX5100C Function List > Parameter Editor > StatusMonitor ID061	
ParamterMonitor3Value	DINT	Parameter monitor selection 3.	2 = No parameter is selected 0x0001...0xFFFF = returned value that is mapped from KNX5100C Function List > Parameter Editor > StatusMonitor ID062	
ParamterMonitor4Value	DINT	Parameter monitor selection 4.	3 = No parameter is selected 0x0001...0xFFFF = returned value that is mapped from KNX5100C Function List > Parameter Editor > StatusMonitor ID063	
ParamterMonitor5Value	DINT	Parameter monitor selection 5.	4 = No parameter is selected 0x0001...0xFFFF = returned value that is mapped from KNX5100C Function List > Parameter Editor > StatusMonitor ID064	

Table 44 - Kinetix 5100 Motion Drive Output Assembly Data

Name	Data Type	Description	Value	Comment
OperatingMode	SINT	This enumerated value indicates the drive's internal mode setting. The drive can operate in different submodes while in IO Mode.	-128...-1 = Reserved 0 = Mode not specified 1 = Position mode 2 = Speed mode 3 = Home mode 4 = Torque mode 5 = Gear mode 6 = Index mode 7 = ECAM mode 8...127 = Reserved	
ServoControl	SINT			
ServoControl.0	BIT	A transition from 0 to 1 enables the motor.		ServoOn
ServoControl.1	BIT	A transition from 0 to 1 disables the motor.		ServoOff
ServoControl.2	BIT	A transition from 0 to 1 stops motion on the motor.		StopMotion
ServoControl.3	BIT	A transition from 0 to 1 clears an active drive fault.		FaultReset
ServoControl.4	BIT	A transition from 0 to 1 means that the motion command is issued from the external controller.		StartMotion
HomingMethod	SINT	The method of Homing.	For more information, see the Kinetix 5100 EtherNet/IP Indexing Servo Drives User Manual, publication 2198-UM004 .	
SpeedReference	DINT	The commanded speed for the motor.	Units are in 0.1 RPM -80000...+80000 1...20000 (home mode)	
AccelReference	DINT	The commanded acceleration rate for the motor.	Units are in 0.1 RPM/sec	
DecelReference	DINT	The commanded deceleration rate for the motor.	Units are in 0.1 RPM/sec	
PositionReference	DINT	The commanded position used for indexing.	The scaling relationship from the E-gear ratio in KNX5100C software defines the User units.	
HomeReturnSpeed	DINT	The return speed when home mode is the operating mode.	Units are in 0.1 RPM (rotary motors) 1...5000	
NonCyclicMoveType	SINT	Enumerated value used to determine the noncyclic move type.	-128...-1 = Reserved 0 = Absolute 1 = Relative 2 = Incremental 3 = High-speed capture 4...127 = Reserved	

Table 44 - Kinetix 5100 Motion Drive Output Assembly Data (Continued)

Name	Data Type	Description	Value	Comment
CyclicMoveType	SINT	Enumerated value used to determine the cyclic move type.	-128...-1 = Reserved 0 = Rotary positive 1 = Rotary negative 2 = Rotary shortest path 3...127 = Reserved	
TravelMode	DINT	Enumerated value used to determine the travel constraints of the axis.	-128...+1 = Reserved 2 = Non-cyclic move 3...9 = Reserved 10 = Cyclic move 11...127 = Reserved	
PositionControl	SINT			
PositionControl.0	BIT	When executing a motion command, the next movement can override the previous movement.	0 = Does not override the previous movement 1 = Can override the previous movement	PositionCommandOverride
PositionControl.1	BIT	The next movement can overlap the end of the current movement.	0 = Does not overlap the next movement 1 = Overlaps the next movement	PositionCommandOverlap
PositionControl.2	BIT	Selects between the high-speed digital inputs that are used to capture position feedback.	Vendor specific 0 = DI9 is selected 1 = DI10 is selected	CapturedPositionSelect
TorqueReference	DINT	Represents the output torque level when the operation mode is Torque Mode (3). This value is in percent of motor rated torque.	-4000...+4000 (enumeration is 0.1x)	
TorqueRampTime	DINT	Represents the time to reach the torque reference.	1...65500 ms	
StartingIndex	SINT	The first index (position register) that the drive should execute.	-128...-1 = Reserved 0 = PR 0: Homing 1...99 = PR 1...PR 99 100...127 = Reserved	
CamMasterReference	SINT			
CamExecutionSchedule	SINT	Future		
CamExecutionMode	SINT	Future		
CamSetting	SINT	Future		
CamSetting3	BIT	Future		CamStopMode
CamSlaveScaling	DINT	Future		
CamLockPosition	DINT	Future		
CamMasterLockPosition	DINT	Future		
CamMasterLeadingCounts	DINT	Future		
CamMasterUnlockCounts	DINT	Future		
CamMasterCyclicLeadingCounts	DINT	Future		
GearRatioSlaveCounts	DINT	Integer value that represents slave counts. This value is P1.044 Gear Ratio Follower Counts from the E-gear ratio in Kinetix 5100 software.		
GearRatioMasterCounts	DINT	Integer value that represents master counts. This value is P1.045 Gear Ratio Master Counts from the E-gear ratio in Kinetix 5100 software.		

Table 45 - PowerFlex 520-series Drive Input Assembly Data (Position Mode)

Name	Data Type	Description	Value	Comment
DriveStatus	INT			
DriveStatus.0	BIT	Indicates whether the drive is ready for operation.	0 = Not ready 1 = Ready	Ready
DriveStatus.1	BIT	Indicates whether the drive is operating.	0 = Not active 1 = Active (Running)	Active
DriveStatus.2	BIT	Indicates the command direction.	0 = Cmd reverse 1 = Cmd forward	CommandDir
DriveStatus.3	BIT	Indicates the rotating direction.	0 = Rotating reverse 1 = Rotating forward	ActualDir
DriveStatus.4	BIT	Indicates the acceleration state.	0 = Not accelerating 1 = Accelerating	Accelerating

Table 45 - PowerFlex 520-series Drive Input Assembly Data (Position Mode) (Continued)

Name	Data Type	Description	Value	Comment
DriveStatus.5	BIT	Indicates the deceleration state.	0 = Not decelerating 1 = Decelerating	Decelerating
DriveStatus.6	BIT	Indicates the Travel Position direction.	0 = Reverse travel position 1 = Forward travel position	ForwardTravel
DriveStatus.7	BIT	Indicates the fault state.	0 = Not faulted 1 = Faulted	Faulted
DriveStatus.8	BIT	Indicates that the drive is at reference speed.	0 = Not at reference 1 = At reference	AtReference
DriveStatus.9	BIT	Indicates that the drive is at commanded position.	0 = Not at position 1 = At position	AtPos
DriveStatus.10	BIT	Indicates that the drive is at the reference home.	0 = Not at home 1 = At home	AtHome
DriveStatus.11	BIT	Indicates whether the drive has been homed since power-up.	0 = Drive not homed 1 = Drive homed	DriveHomed
DriveStatus.12	BIT	Indicates if the frequency is holding.	0 = Not sync hold 1 = Sync hold	SyncHold
DriveStatus.13	BIT	Indicates if the frequency accelerating to the new commanded frequency in drive parameter A571 [Sync Time].	0 = Not sync ramp 1 = Sync ramp	SyncRamp
DriveStatus.14	BIT	Indicates if Traverse is enabled.	0 = Traverse off 1 = Traverse on	TraverseOn
DriveStatus.15	BIT	Indicates if the drive is decelerating in Traverse mode.	0 = Not Traverse decel 1 = Traverse decel	TraverseDecel
OutputFreq	INT	Display the reference speed of the drive.	In units of 0.01 Hz.	

Table 46 - PowerFlex 520-series Drive Output Assembly Data (Position Mode)

Name	Data Type	Description	Value	Comment
LogicCommand	INT			
LogicCommand.0	BIT	Perform a normal stop.	0 = Not normal stop 1 = Normal stop	Stop
LogicCommand.1	BIT	Command the drive the start.	0 = Not start 1 = Start	Start
LogicCommand.2	BIT	Command the drive to jog.	0 = Not jog 1 = Jog	Jog
LogicCommand.3	BIT	Clear drive fault.	0 = Not clear fault 1 = Clear fault	ClearFaults
LogicCommand.4	BIT	Command the direction of the drive.	00 = No command 01 = Forward command 10 = Reverse command 11 = No command	Forward
LogicCommand.5	BIT			Reverse
LogicCommand.6	BIT	This provides an identical function as the "Logic In1" Digital Input option.	1 = Logic In 1	LogicIn1
LogicCommand.7	BIT	This provides an identical function as the "Logic In2" Digital Input option.	1 = Logic In 2	LogicIn2
LogicCommand.8	BIT	Select the pre-programmed frequency and position step.	000 = Frequency and position step 0 001 = Frequency and position step 1 010 = Frequency and position step 2 011 = Frequency and position step 3 100 = Frequency and position step 4 101 = Frequency and position step 5 110 = Frequency and position step 6 111 = Frequency and position step 7	Freq_PosSel01
LogicCommand.9	BIT			Freq_PosSel02
LogicCommand.10	BIT			Freq_PosSel03
LogicCommand.11	BIT	Next start command causes the drive to find home.	1 = Find home	FindHome
LogicCommand.12	BIT	Overrides other inputs and causes the drive to remain at its current step (running at zero speed once it reaches its position) until released.	1 = Hold step	HoldStep
LogicCommand.13	BIT	Resets the home position to the current position of the machine. Set this bit to 0 after completing the homing routine.	1 = Pos redefine	PosRedefine

Table 46 - PowerFlex 520-series Drive Output Assembly Data (Position Mode) (Continued)

Name	Data Type	Description	Value	Comment
LogicCommand.14	BIT	Hold the existing frequency when sync time is set to enable speed synchronization.	1 = Sync enable	SyncEnabled
LogicCommand.15	BIT	Disable the traverse function	1 = Traverse disable	TravDisable
FreqCommand	INT	Control the reference speed of the drive.	In units of 0.01 Hz	

Table 47 - PowerFlex 520-series Drive Input Assembly Data (Velocity Mode)

Name	Data Type	Description	Value	Comment
DriveStatus	INT			
DriveStatus.0	BIT	Indicates whether the drive is ready for operation.	0 = Not ready 1 = Ready	Ready
DriveStatus.1	BIT	Indicates whether the drive is operating.	0 = Not active 1 = Active (Running)	Active
DriveStatus.2	BIT	Indicates the command direction.	0 = Cmd reverse 1 = Cmd forward	CommandDir
DriveStatus.3	BIT	Indicates the rotating direction.	0 = Rotating reverse 1 = Rotating forward	ActualDir
DriveStatus.4	BIT	Indicates the acceleration state.	0 = Not accelerating 1 = Accelerating	Accelerating
DriveStatus.5	BIT	Indicates the deceleration state.	0 = Not decelerating 1 = Decelerating	Decelerating
DriveStatus.6	BIT	Reserved.		
DriveStatus.7	BIT	Indicates the fault state.	0 = Not faulted 1 = Faulted	Faulted
DriveStatus.8	BIT	Indicates that the drive is at reference speed.	0 = Not at reference 1 = At reference	AtReference
DriveStatus.9	BIT	Indicates that the main frequency is controlled by the active communication.	1 = Main frequency controlled by active comm	CommFreqCnt
DriveStatus.10	BIT	Indicates that the operation command is controlled by the active communication.	1 = Operation command controlled by active comm	CommLogicCnt
DriveStatus.11	BIT	Indicates that the parameters are locked.	1 = Parameters are locked	ParmsLocked
DriveStatus.12	BIT	Indicates the Digital Input 1 status.		DigIn1Active
DriveStatus.13	BIT	Indicates the Digital Input 2 status.		DigIn2Active
DriveStatus.14	BIT	Indicates the Digital Input 3 status.		DigIn3Active
DriveStatus.15	BIT	Indicates the Digital Input 4 status.		DigIn4Active
OutputFreq	INT	Display the reference speed of the drive.	In units of 0.01 Hz.	

Table 48 - PowerFlex 520-series Drive Output Assembly Data (Velocity Mode)

Name	Data Type	Description	Value	Comment
LogicCommand	INT			
LogicCommand.0	BIT	Perform a normal stop.	0 = Not normal stop 1 = Normal stop	Stop
LogicCommand.1	BIT	Command the drive the start.	0 = Not start 1 = Start	Start
LogicCommand.2	BIT	Command the drive to jog.	0 = Not jog 1 = Jog	Jog
LogicCommand.3	BIT	Clear drive fault.	0 = Not clear fault 1 = Clear fault	ClearFaults
LogicCommand.4	BIT	Command the direction of the drive.	00 = No command 01 = Forward command 10 = Reverse command 11 = No command	Forward
LogicCommand.5	BIT			Reverse
LogicCommand.6	BIT	Force keypad control.	0 = Not keypad control 1 = Forced keypad control	ForceKeypadCtrl
LogicCommand.7	BIT	Increases the value of drive parameter A427 [MOP Freq] at the rate set in A430 [MOP Time].	0 = Not increment 1 = MOP increment	MOPIncrement

Table 48 - PowerFlex 520-series Drive Output Assembly Data (Velocity Mode) (Continued)

Name	Data Type	Description	Value	Comment
LogicCommand.8	BIT	Select the Accel Rate.	00 = No command 01 = Accel Rate 1 enable 10 = Accel Rate 2 enable 11 = Hold Accel Rate selected	AccelRate1
LogicCommand.9	BIT			AccelRate2
LogicCommand.10	BIT	Select the Decel Rate.	00 = No command 01 = Decel Rate 1 enable 10 = Decel Rate 2 enable 11 = Hold Decel Rate selected	DecelRate1
LogicCommand.11	BIT			DecelRate2
LogicCommand.12	BIT	Frequency selection of drive parameters Speed Reference 1...3 and Preset Freq 0...3.	000 = No command 001 = Freq source = P047 (Speed Reference 1) 010 = Freq source = P049 (Speed Reference 2) 011 = Freq source = P051 (Speed Reference 3) 100 = Freq source = A410 (Preset Freq 0) 101 = Freq source = A411 (Preset Freq 1) 110 = Freq source = A412 (Preset Freq 2) 111 = Freq source = A413 (Preset Freq 3)	FreqSel01
LogicCommand.13	BIT			FreqSel02
LogicCommand.14	BIT			FreqSel03
LogicCommand.15	BIT	Decreases the value of drive parameter A427 [MOP Freq] at the rate set in A430 [MOP Time].	0 = Not decrement 1 = MOP decrement	MOPDecrement
FreqCommand	INT	Control the reference speed of the drive.	In units of 0.01 Hz	

Use of the User-defined Function Block Library

When a PowerFlex 520-series or Kinetix 5100 drive is used with Connected Components Workbench software, the use of the predefined user-defined function block (UDFB) provides an easy way to program your simple drive control application.

Table 49 - UDFB List for PowerFlex520-series Drives

Name	Description
RA_PF523_VEL	PowerFlex 523 Velocity Mode control. This instruction allows simple PowerFlex 523 drive control in Velocity Mode.
RA_PF525_VEL	PowerFlex 525 Velocity Mode control. This instruction allows simple PowerFlex 525 drive control in Velocity Mode.
RA_PF525_POS	PowerFlex 525 Position Mode control. This instruction allows simple PowerFlex 525 drive control in Position Mode.

Table 50 - UDFB Motion Instruction List for Kinetix 5100 Drives

Name	Description
raC_Opr_K5100_MSO	Motion Servo On. Use the Motion Servo On instruction to activate the drive output and to activate the drive servo loops.
raC_Opr_K5100_MSF	Motion Servo Off. Use the Motion Servo Off instruction to deactivate the drive output and to deactivate the drive servo loops.
raC_Opr_K5100_MAJ	Motion Axis Jog Use the Motion Axis Jog instruction to accelerate or decelerate the motor at a constant speed without termination.
raC_Opr_K5100_MAT	Motion Axis Torque Use the Motion Axis Torque instruction to use torque limiting while a predefined speed is used to move the motor.
raC_Opr_K5100_MAM	Motion Axis Move Use the Motion Axis Move instruction to move the motor to a specified position.
raC_Opr_K5100_MAH	Motion Axis Home Use the Motion Axis Home instruction to home the motor.
raC_Opr_K5100_MAG	Motion Axis Gear Use the Motion Axis Gear instruction to set the gear ratio between a pulse-source and follower drive. IMPORTANT: This UDFB changes the drive E-gear ratio; Slave/Follower ID151 (P1.044) and Master ID152 (P1.045) Counts. If your drive is positioning, be aware that the units are impacted because the E-gear ratio controls the counts/motor rotation value.