

LISTEN.
THINK.
SOLVE.SM

RSLogix 5000 v16 Integrated Drive Profiles

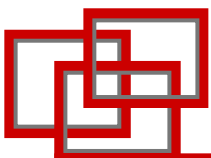
Premier Integration

Rick Nusbaum

Schaedler Yesco Distribution

ALLEN-BRADLEY • ROCKWELL SOFTWARE

Rockwell
Automation



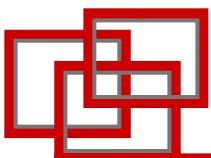
RSLogix 5000 v16 - Integrated Drive Profiles

The screenshot shows the RSLogix 5000 software interface. The main window title is "RSLogix 5000 - My_System in My_Controller.ACD [1756-L63]". The interface includes a menu bar (File, Edit, View, Search, Logic, Communications, Tools, Window, Help), a toolbar, and a project tree on the left. The project tree shows a hierarchy of tasks and modules, including "I/O Configuration" and "Ethernet".

The "Module Properties" dialog is open, showing the "Drive" tab. The drive is identified as "My_PF70EC" and is currently "Offline". The drive specifications are:

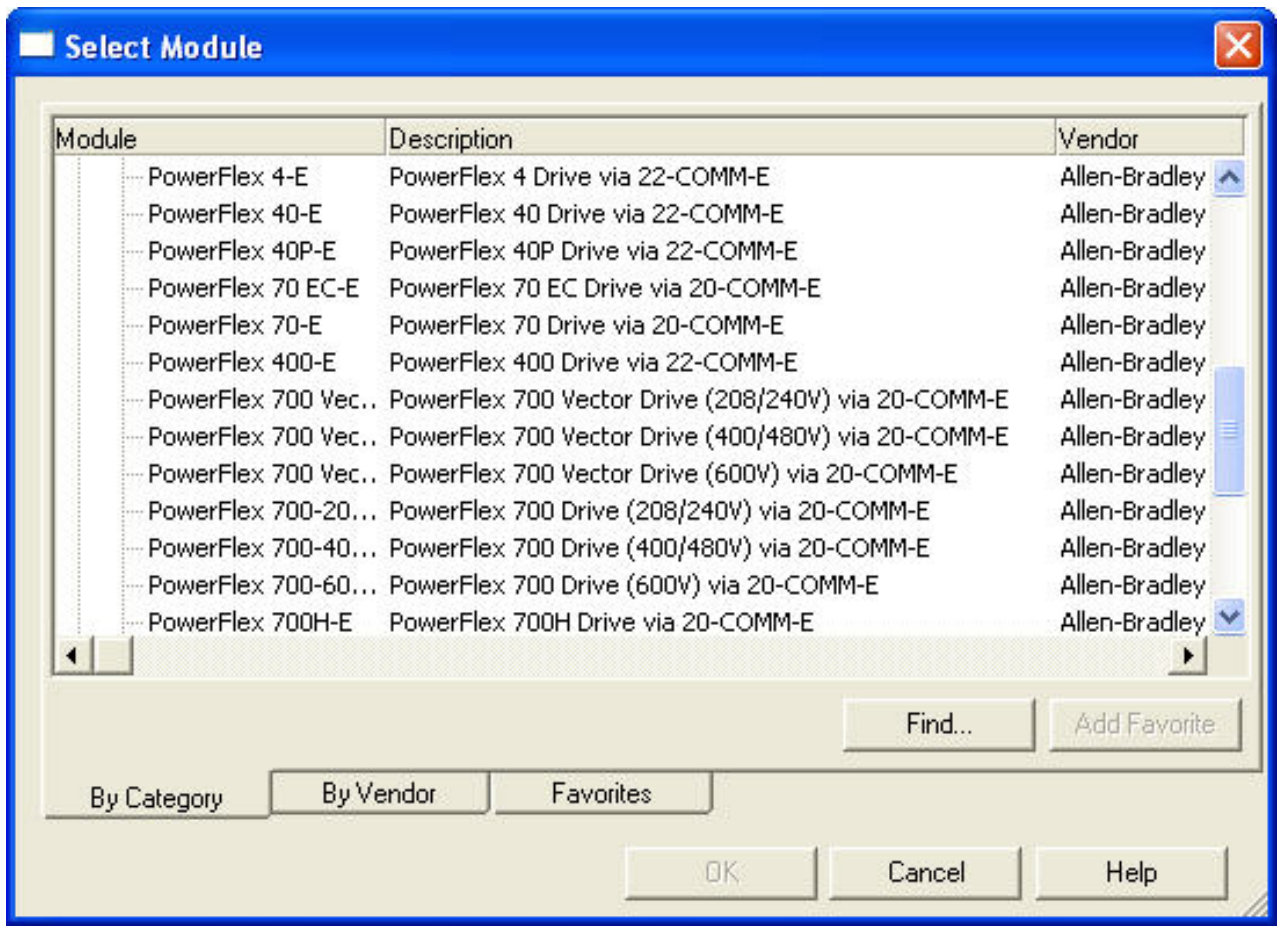
- PowerFlex 70 EC
- 240V 4.2A
- Port: 0
- Revision: 2.003

The dialog also shows a "Drive: Not Connected" status and a "Connect to Drive" button. The status bar at the bottom of the dialog indicates "Status: Offline".

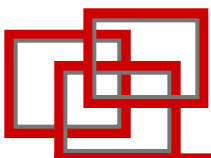


RSLogix 5000 v16 - Integrated Drive Profiles

- Select Module

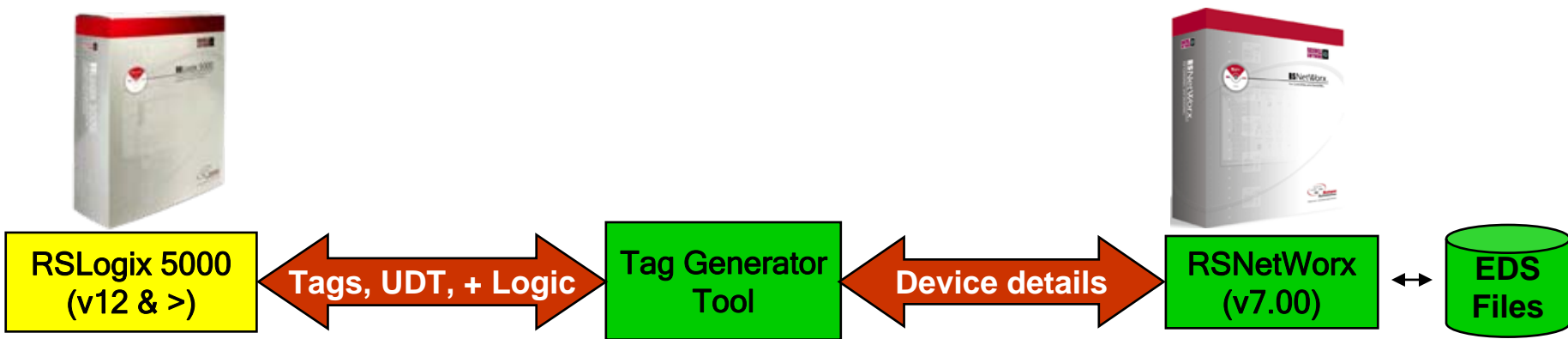


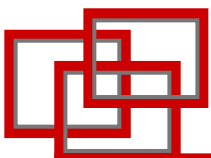
**PowerFlex 7-Class and 4-Class drives, and most SCANport-enabled drives
ControlNet and EtherNet/IP networks only**



RSLogix 5000 v16 - Integrated Drive Profiles

- Where are the DeviceNet Profiles?
 - RSLogix 5000 does not support DeviceNet Profiles today
 - Current solution: DeviceNet Tag Generator Tool
 - Customer launches Tag Generator Tool to retrieve and select DeviceNet scanners configured in RSLogix 5000 *.ACD project and in the RSNetWorx *.dnt project file
 - Tag Generator Tool retrieves device details from RSNetWorx *.dnt project file
 - Device details included in enhanced Electronic Data Sheet files
 - Tool defines structures, tags, User Defined Data Type (UDT) and logic, and automatically creates them in the RSLogix 5000 ACD project





RSLogix 5000 v16 - Integrated Drive Profiles

- General Tab

Module Properties: My_ENBT (PowerFlex 70 EC-E 2.3)

General | Connection | Module Info | Port Configuration | Drive

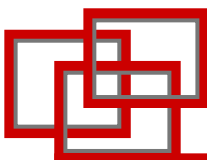
Type: PowerFlex 70 EC-E PowerFlex 70 EC Drive via 20-COMM-E
Vendor: Allen-Bradley
Parent: My_ENBT
Name: My_PF70EC
Description:

Address / Host Name
 IP Address: 10 . 91 . 97 . 76
 Host Name:

Module Definition
Series: None **Change ...**
Revision: 2.3
Electronic Keying: Compatible Module
Connection: **Parameters via Datalinks**
Data Format: **Parameters**

I/O Size is set in the Module Definition

Status: Offline
OK Cancel Apply Help



RSLogix 5000 v16 - Integrated Drive Profiles

- Module Definition

Dynamically select the data you need

Module Definition*

Revision: 2 3

Electronic Keying: Compatible Module

Drive Rating: 240V 4.2A

Datalink	Input Data	Output Data
	DriveStatus	DriveLogicRslt
	OutputFreq	CommandedFreq
<input checked="" type="checkbox"/> A	OutputCurrent - 3	AccelTime1 - 140
	OutputCurrent - 3	DecelTime1 - 142
<input checked="" type="checkbox"/> B	DCBusVoltage - 12	Undefined_B1
	Undefined_B2	Undefined_B2
<input type="checkbox"/> C		
<input type="checkbox"/> D		

Sort Input/Output selection lists by Parameter Name

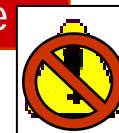
DANGER: Unexpected, hazardous motion of machinery may occur when improperly using software to configure a drive.

Parameter names selected for the Input and Output Data appear as member names in the drive Module-Defined Data Types and as link parameters in the RSLogix 5000 configuration to the drive to ensure that the communication module configurations are correct.

Cancel Help

Automatically configures up to 19 parameters in the drive

Configures the I/O image in BOTH the controller (offline) and the drive



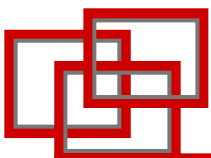
Drive Explorer

File Edit Explore Actio

Devices - EtherNet/IP Direct

- Mode 1: - Conveyor 1B
 - 0 - PowerFlex 70 EC 208V 4.8A
 - Parameter List
 - Monitor
 - Motor Control
 - Speed Command
 - Dynamic Control
 - Utility
 - Communication
 - Comm Control
 - Masks & Owners
 - Datalinks
 - Security
 - Inputs & Outputs
 - 1 - LCD Module
 - Parameter List
 - 5 - 20-COMM-E EtherNet/IP
 - Parameter List

S	N:P.P#	Name	Value
1:	5.23	DPI I/O Cfg	xxx0 0111
1:	5.35	M-5 Input	xxx0 0111
1:	5.36	M-5 Output	xxx0 0111
1:	0.300	Data In A1	140
1:	0.301	Data In A2	142
1:	0.302	Data In B1	0
1:	0.303	Data In B2	0
1:	0.304	Data In C1	0
1:	0.305	Data In C2	0
1:	0.306	Data In D1	0
1:	0.307	Data In D2	0
1:	0.310	Data Out A1	3
1:	0.311	Data Out A2	3
*	0.312	Data Out B1	12
*	0.313	Data Out B2	0
*	0.314	Data Out C1	0
*	0.315	Data Out C2	0
*	0.316	Data Out D1	0
*	0.317	Data Out D2	0



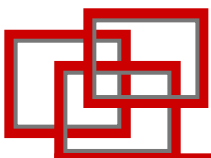
RSLogix 5000 v16 - Integrated Drive Profiles

- Auto-Generation of Tags

Name	Data Type	Style	Description
My_PF70EC:I	AB:PowerFlex70E...		
+ My_PF70EC:I.DriveStatus	INT	Binary	
- My_PF70EC:I.DriveStatus_Ready	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_Active	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_CommandDir	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_ActualDir	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_Accelerating	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_Decelerating	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_Alarm	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_Faulted	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_AtSpeed	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_LocallD0	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_LocallD1	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_LocallD2	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_SpdRefID0	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_SpdRefID1	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_SpdRefID2	BOOL	Decimal	
- My_PF70EC:I.DriveStatus_SpdRefID3	BOOL	Decimal	
+ My_PF70EC:I.OutputFreq	INT	Decimal	
+ My_PF70EC:I.OutputCurrent	DINT	Decimal	
+ My_PF70EC:I.DCBusVoltage	INT	Decimal	
+ My_PF70EC:I.Undefined_B2	INT	Decimal	

All tags are descriptive
(now Datalinks are too)

and use a data type
respective of the
parameter



RSLogix 5000 v16 - Integrated Drive Profiles

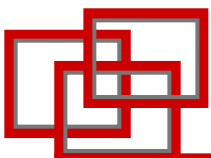
- Two Software Applications are now **ONE** Software Application

The screenshot displays the RSLogix 5000 software interface. The main window shows a project tree on the left with folders like 'MainTask', 'Motion Groups', and 'Data Types'. A 'Module Properties' dialog box is open in the foreground, showing details for a 'PowerFlex 70 EC' drive. The dialog has tabs for 'General', 'Connection', 'Module Info', 'Port Configuration', and 'Drive'. The 'Drive' tab is active, displaying a photo of the drive and the following specifications:

- PowerFlex 70 EC
- 240V 4.2A
- Port: 0
- Revision: 2.003

The status at the bottom of the dialog is 'Offline'. The background window shows the 'Path' as 'AB_ETH-1\10.91.97.73\Backplane\0' and a table of I/O addresses on the right side.

Alias	Internal
	-4000
	-4000
	0
	-8192
	-8192
	0
	0
	0
	0
	0
	-4000
	0
	-32767
	-32767
	0
	0
	0
	0
	0
	0
	4600
	80
	600
	1750
	0



RSLogix 5000 v16 - Integrated Drive Profiles

- Drive Tab



Upload



Download



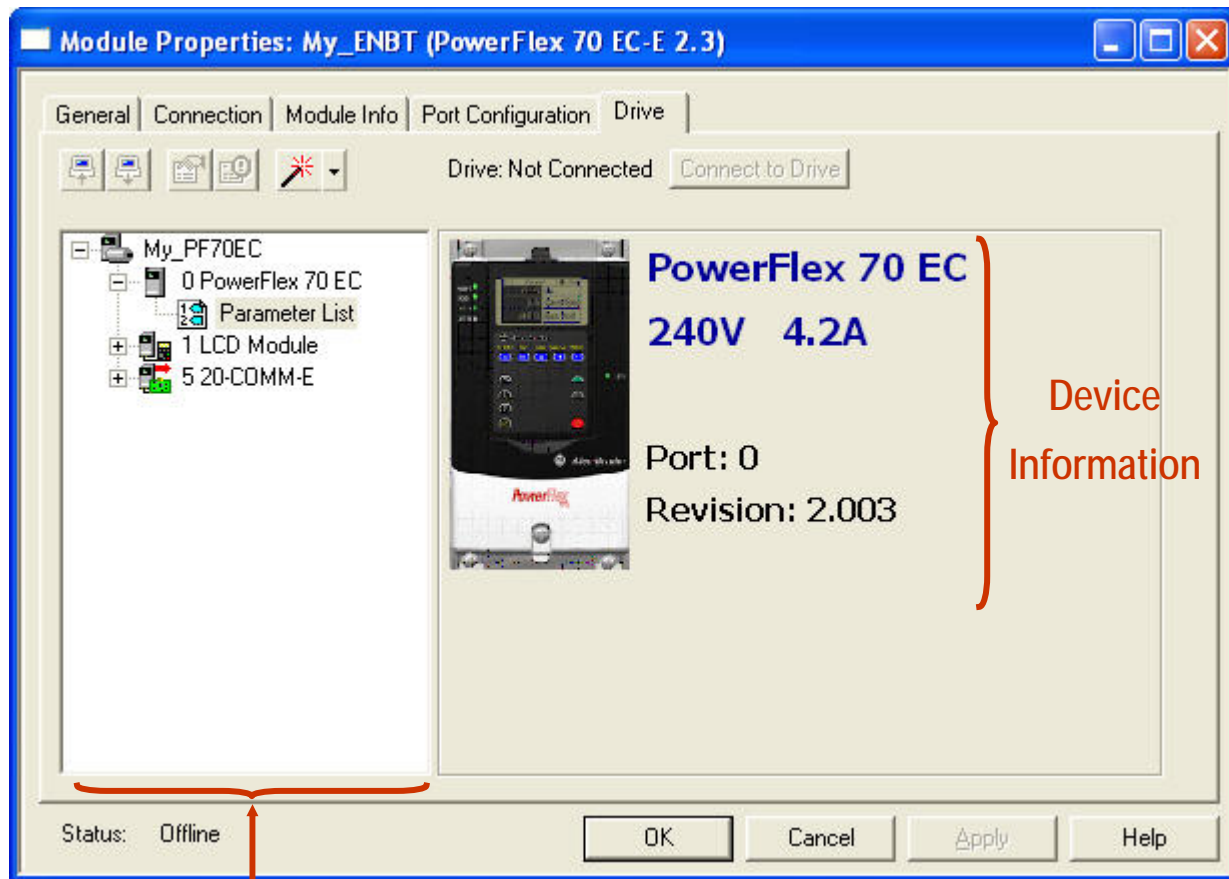
Properties



Faults, Alarms, Events



Wizards



Device Pane similar to

DriveTools SP and DriveExplorer

RSLogix 5000 v16 - Integrated Drive Profiles

- Parameter List Editor - Linear and File/Group

In-grid editing similar to DriveTools SP

Parameter List - PowerFlex 70 EC

Parameter Group: All Parameters

ID	Name	Value	Units	Internal Value
1	Output Freq	0.0	Hz	
2	Commanded Freq	0.0	Hz	
3	Output Current	0.00	Amps	
4	Torque Current	0.00	Amps	
5	Flux Current	0.00	Amps	
6	Output Voltage	0.0	VAC	
7	Output Power	0.00	kW	
8	Output Powr Fctr	0.00		
9	Elapsed MWh	0.0	MWh	
10	Elapsed Run Time	0.0	Hrs	
11	MOP Frequency	0.0	Hz	
12	DC Bus Voltage	0.0	VDC	
13	DC Bus Memory	0.0	VDC	
14	Elapsed kWh	0.0	kWh	
16	Analog In1 Value	0.000		
17	Analog In2 Value	0.000		
22	Ramped Speed	0.0	Hz	
23	Speed Reference	0.0	Hz	
24	Commanded Torque	0.0	%	
25	Speed Feedback	0.0		

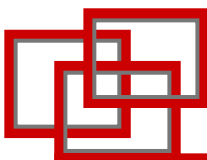
Print... Parameter Help

Parameter List - PowerFlex 70 EC

Parameter Group: Motor Data

ID	Name	Value	Units	Internal Value	Min	Max
40	Motor Type	Induction		0	Induction	Synch...
41	Motor NP Volts	230.0	VAC	2300	0.0	690.0
42	Motor NP FLA	2.9	Amps	29	0.0	3200.0
43	Motor NP Hertz	60.0	Hz	600	5.0	500.0
44	Motor NP RPM	1740	RPM	1740	60	24000
45	Motor NP Power	1.00		100	0.00	412.48
46	Mtr NP Pwr Units	Horsepower		0	Horsepower	kilow...
47	Motor OL Hertz	20.0	Hz	200	0.0	500.0
48	Motor OL Factor	1.00		100	0.20	2.00
49	Motor Poles	4		4	2	40

Print... Parameter Help Close Help



RSLogix 5000 v16 - Integrated Drive Profiles

- Wizards




PowerFlex 70EC Startup Wizard - (1 of 13)

Wizard Step

- ✓ Welcome
- Reset Parameters
- Motor Control
- Motor Data
- Stop / Brake Mode
- Direction Test
- AutoTune
- Ramp Rates / Speed Limits
- Speed Control
- Digital Inputs
- Digital Outputs
- Analog Outputs
- Applied and Pending Changes

Welcome



Wizard Revision
1.1.0

The PowerFlex 70 / PowerFlex 70EC Startup Wizard assists in setting commonly used drive parameters. It is recommended that the wizard steps be performed sequentially.

With exception of resetting parameters, motor direction testing and

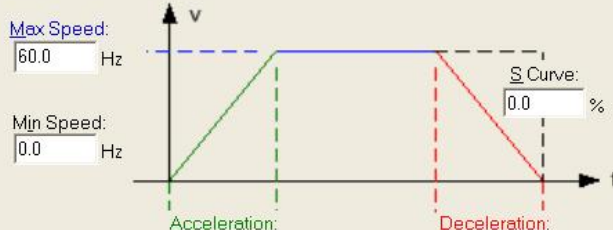
Same wizards used with
DriveTools SP and DriveExplorer

PowerFlex 70EC Startup Wizard - (8 of 13)

Wizard Step

- ✓ Welcome
- Reset Parameters
- Motor Control
- Motor Data
- Stop / Brake Mode
- Direction Test
- AutoTune
- ✓ Ramp Rates / Speed Limits
- ✓ Speed Control
- Digital Inputs
- Digital Outputs
- Analog Outputs
- Applied and Pending Changes

Ramp Rates / Speed Limits



Max Speed: 60.0 Hz

Min Speed: 0.0 Hz

Acceleration: Defined: 10.0 Secs, Actual: 10.0 Secs

Deceleration: Defined: 10.0 Secs, Actual: 10.0 Secs

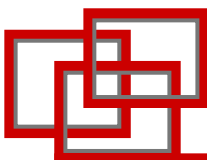
S Curve: 0.0 %

Enable reverse operation

Direction Method: Fwd/Rev Command

Rev Speed Limit: 0.0 Hz

Buttons: Cancel, < Back, Next >, Finish >>



RSLogix 5000 v16 - Integrated Drive Profiles

- Diagnostic Items

Diagnostic Item List **PowerFlex 70 EC**

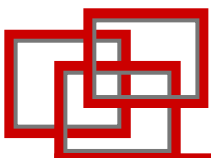
ID	Name	Value	Units	Int
1	DPI Error Status	0		
2	Heatsink Temp	31.6	degC	
3	Active Cur Limit	6646		
4	Active PWM Freq	4	kHz	
5	Life MegaWatt Hr	0.0	MWh	
6	Life Run Time	37.3	Hrs	
7	Life Pwr Up Time	2346.3	Hrs	
8	Life Pwr Cycles	58		
9	Life MW Fraction	8656		
10	Life MW Units	0		
11	Reserved	0		
12	Raw In 1 ma	5		
13	Raw In 1 volts	2		
14	Raw In 2 plus	7		
15	Raw In 2 minus	1		
16	CS Msg Rx Cnt	510		
17	CS Msg Tx Cnt	510		
18	CS Timeout Cnt	0		
19	CS Msg Bad Cnt	0		
20	Reserved	0		

Print... Item Help

Diagnostic Item List **20-COMM-E**

ID	Name	Value	Units	Internal Value	Min	Max
1	Common Logic Cmd	1		1	0	65535
2	Prod Logic Cmd	0000000000000000		0	00000000...	11111111
3	Reference	7562		7562	-2147483648	2147483648
4	Common Logic Sts	0100010001111111		17535	00000000...	11111111
5	Prod Logic Sts	0000111100001111		3855	00000000...	11111111
6	Feedback	7562		7562	-2147483648	2147483648
7	Datalink A1 In	50		50	0	4294967296
8	Datalink A2 In	50		50	0	4294967296
9	Datalink B1 In	0		0	0	4294967296
10	Datalink B2 In	0		0	0	4294967296
11	Datalink C1 In	0		0	0	4294967296
12	Datalink C2 In	0		0	0	4294967296
13	Datalink D1 In	0		0	0	4294967296
14	Datalink D2 In	0		0	0	4294967296
15	Datalink A1 Out	14		14	0	4294967296
16	Datalink A2 Out	0		0	0	4294967296
17	Datalink B1 Out	3277		3277	0	4294967296
18	Datalink B2 Out	0		0	0	4294967296
19	Datalink C1 Out	0		0	0	4294967296
20	Datalink C2 Out	0		0	0	4294967296

Print... Item Help Close Help



RSLogix 5000 v16 - Integrated Drive Profiles

- Fault, Alarm and Event Information



PowerFlex 70 EC Fault, Event, and Alarm Information

Port 0-PowerFlex 70 EC

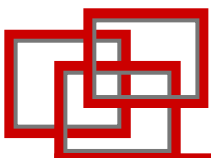
Faults | Trip Fault

Code	Description	Elapsed Time
00052	Faults Cleared	2344:09:12.960
00075	Port 5 Adapter	2325:29:18.960
00052	Faults Cleared	2255:54:23.760
00048	Params Defaulted	2255:51:52.560
00052	Faults Cleared	2255:48:11.880
00075	Port 5 Adapter	2255:47:49.560
00052	Faults Cleared	2155:19:49.080
00004	UnderVoltage	2148:26:05.280
00075	Port 5 Adapter	2148:26:02.040
00052	Faults Cleared	2067:41:17.160
00075	Port 5 Adapter	2059:19:05.520
00052	Faults Cleared	2011:44:45.960
00075	Port 5 Adapter	2011:41:57.120
00049	Drive Powerup	2011:20:51.000
00052	Faults Cleared	2011:15:54.000

Clear Faults...
Clear Fault Queue...
Reset Drive...
Refresh Display
Print...
Fault Help...

Close Help

Same component used
in DriveTools SP

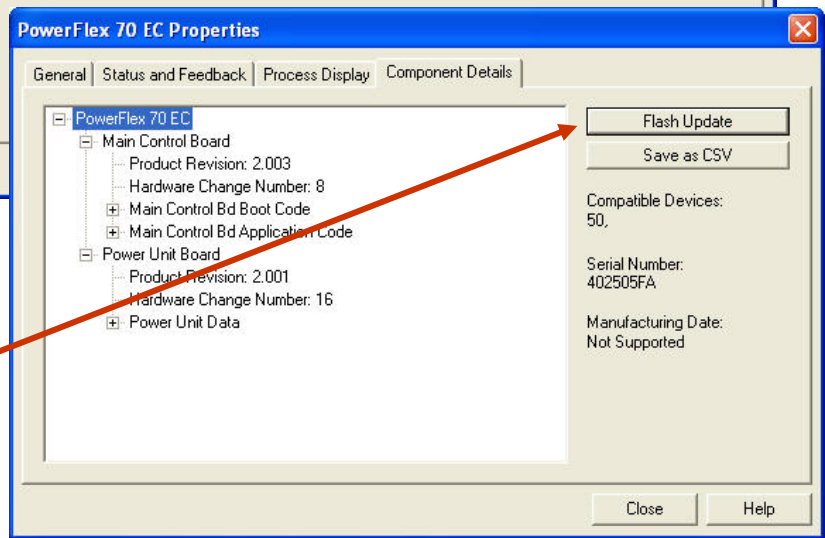
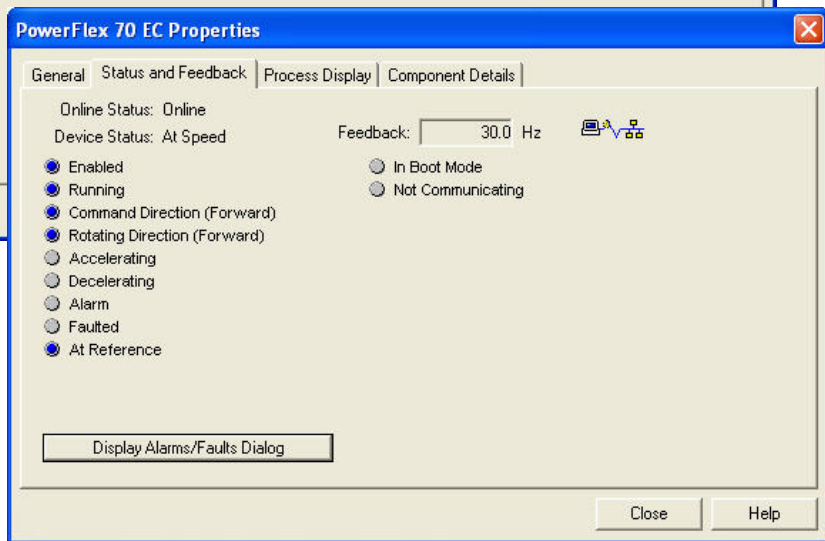
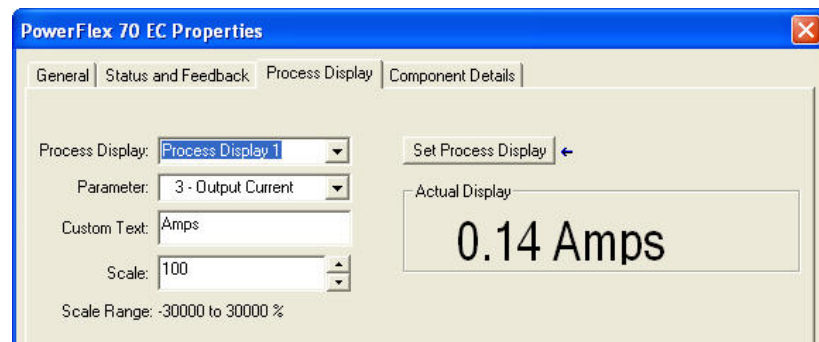
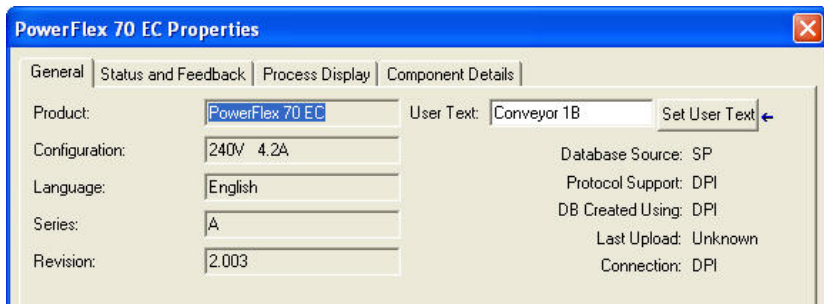


RSLogix 5000 v16 - Integrated Drive Profiles

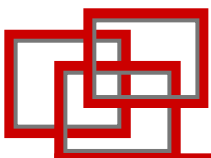
- Device Properties



Same component used
in DriveTools SP



Flash drives and peripherals
directly from RSLogix 5000



RSLogix 5000 v16 - Integrated Drive Profiles

- Drive configuration settings are saved in the ControlLogix processor since it is part of the .ACD file
 - **Single** repository of system configuration settings
 - User manually downloads the drive configuration settings

RSLogix 5000
*.ACD file

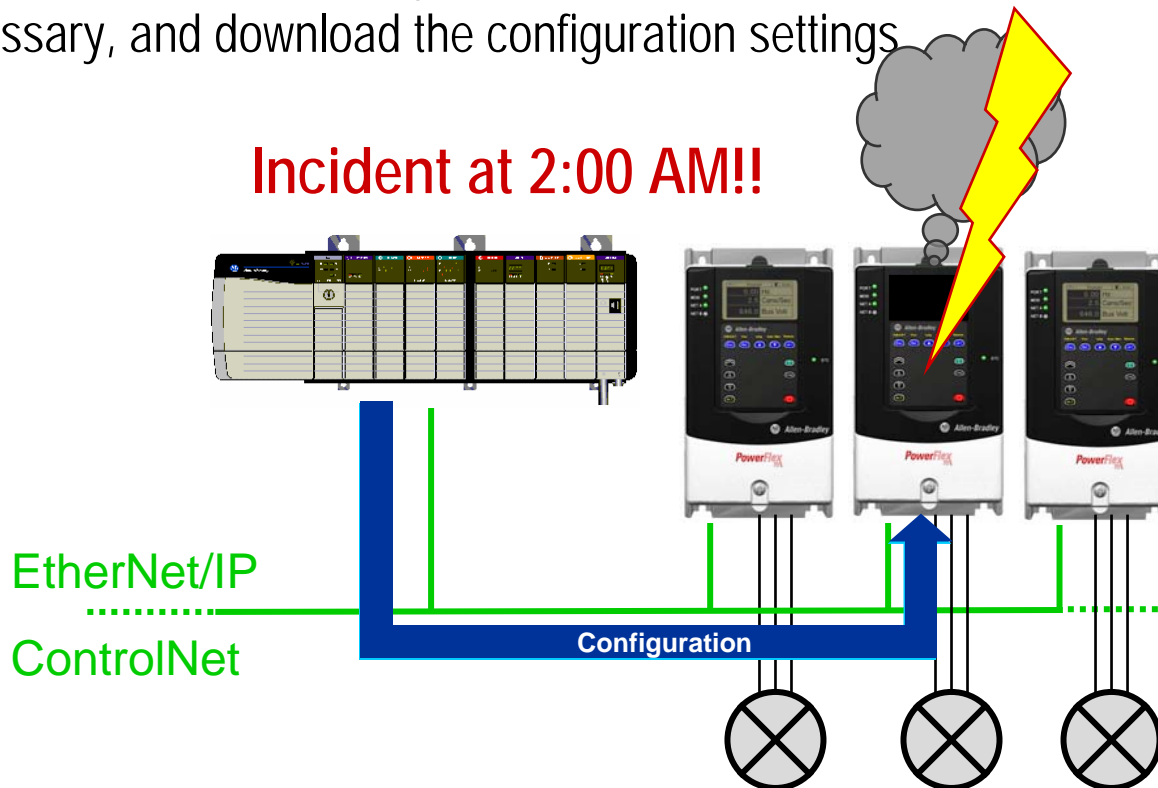
Configuration settings
for each drive

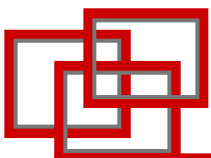


RSLogix 5000 Future Plans (v17+)

- Firmware Supervisor
 - Ability to store flash files in controller and flash nodes
 - Flash update PowerFlex 7-Class drives and connected DPI peripherals
- Controller-based Automatic Device Replacement (ADR)
 - Controller will automatically detect a node replacement, flash it if necessary, and download the configuration settings

v16 supports
flashing the
drive only

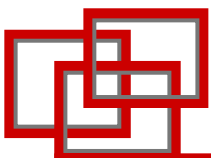




Integrated Drive Profiles - Benefits

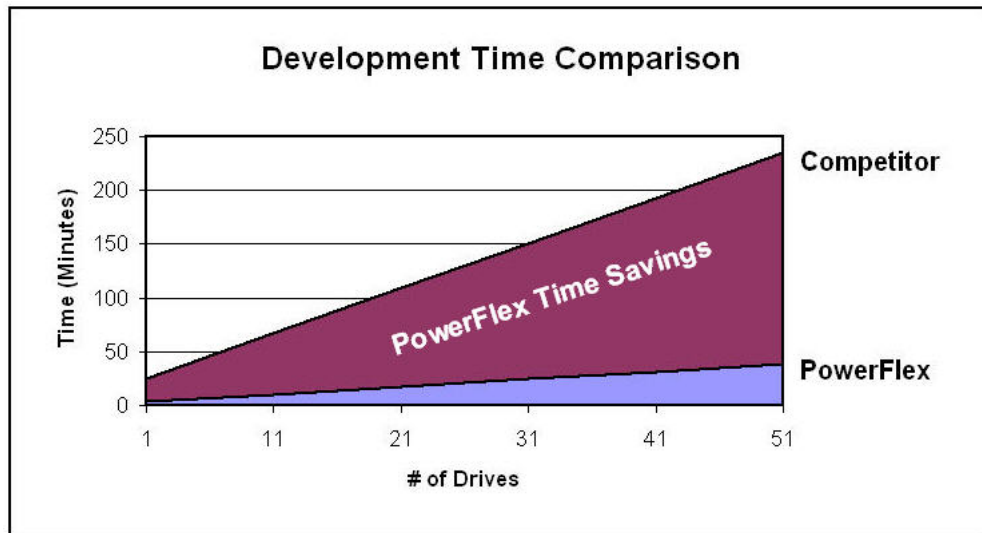
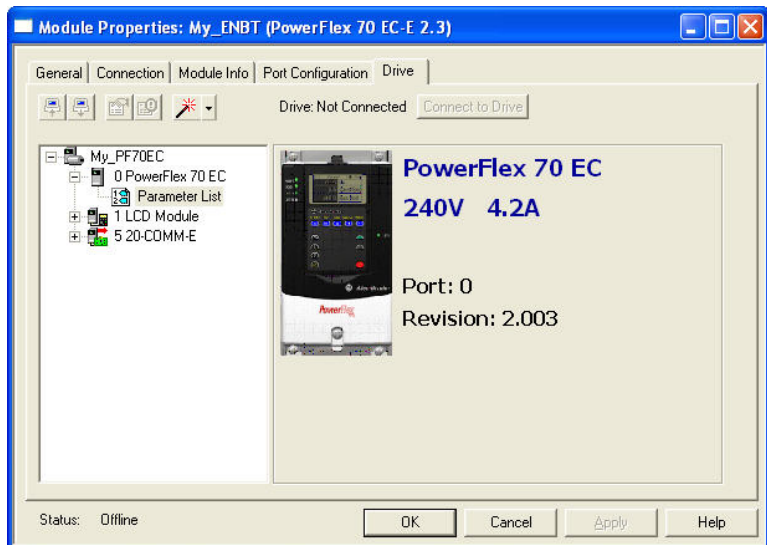
- Reduce drive system development time by as much as 70%*:
 - Use one software tool to configure the entire Logix / drive system
 - Controller and drive network connections are configured at the same time
 - eliminates I/O mismatch errors
 - Dynamically select drive parameters transmitted as network I/O
 - communicate only what is needed for the application
 - Auto-generation of descriptive tag names
 - eliminates the need to enter individual tag descriptions
 - Auto-generation of respective tag data types
 - eliminates the need to convert from one data type to another
 - All drive configurations are saved in the RSLogix project file and in the Logix controller
 - provides a single source of drive configuration data
 - Copy & Paste capability simplifies creating additional duplicate drives
 - duplicates the drive configuration settings so all the new drive needs is a different node address
 - Allows use of the same easy-to-use drive configuration Wizards used in DriveTools SP and DriveExplorer

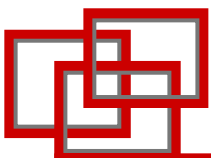
* Figure obtained from timed side-by-side drive configuration comparison testing



Integrated Drive Profiles - Benefits

- Develop systems that are easier to maintain:
 - Drive diagnostic, fault, alarm and event information is integral to RSLogix 5000
 - Drive Tech Support Wizard can be run from RSLogix 5000 to collect all pertinent information about a drive, it's peripherals, various software components, and PC operating system
 - Drives can be flash updated from RSLogix 5000
 - Having a single repository of drive configuration data (in RSLogix project file) speeds drive replacement





PowerFlex Family of Drives

