EnDat, SSI and BiSS ALT Mode

With the release of the UnidriveM 7xx and the DigitaxHD75x, new selections were created in the drop down for 3.038, P1 Device Type. The new types are ENDAT Alt, SSI Alt, and Biss Alt as shown in Figure 1 with Values 18-20.

Parameter	03.038 *P1 Device Type*		
Short description	Defines the device type connected to the drive P1 position feedback interface		
Mode	RFC-S		
Minimum	0	Maximum	20
Default	3	Units	
Type	8 Bit User Save	Update Rate	Background read
Display Format	Standard	Decimal Places	0
Coding	RW, TE		

Value	Text
0	AB
1	FD
2	FR
3	AB Servo
4	FD Servo
5	FR Servo
6	SC
7	SC Hiperface
8	EnDat
9	SC EnDat
10	SSI
11	SC SSI
12	SC Servo
13	BiSS
14	Resolver
15	SC SC
16	Commutation Only
17	SC BiSS
18	EnDat Alt
19	SSI Alt
20	BiSS Alt

Figure 1

Control Techniques a division of Nidec Motor Corporation
7777Golden Triangle Dr. – Suite 250 - Eden Prairie, MN 55344-3505 USA
T: +1 952 995-8000 www.controltechniques.us

The purpose of this was to allow end users the capacity to use the same feedback cable when transitioning from the Unidrive Classic or from the UnidriveSP product lines.

4.4.3 Position feedback connection details

Table 4-10 P1 Position feedback connection details

P1 Position feedback interface Pr 03.038	Connections														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
AB (0)	A	A\	B	B\	Z	Z\							+V	0V	Th
FD (1)	F	F\	D	D\	Z	Z\									
FR (2)	F	F\	R	R\	Z	Z\									
AB Servo (3)	A	A\	B	B\	Z	Z\	U	U\	V	V\	W	W\			
FD Servo (4)	F	F\	D	D\	Z	Z\	U	U\	V	V\	W	W\			
FR Servo (5)	F	F\	R	R\	Z	Z\	U	U\	V	V\	W	W\			
SC (6)	A (Cos)	A\ (Cos\)	B (Sin)	B\ (Sin\)	Z	Z\									
SC Hiperface (7)	Cos	Cosref	Sin	Sinref	DATA	DATA\									
EnDat (8)	DATA	DATA\	CLK	CLK\	Freeze	Freeze\									
SC EnDat (9)	A	A\	B	B\	DATA	DATA\					CLK	CLK\			
SSI (10)	DATA	DATA\	CLK	CLK\	Freeze	Freeze\									
SC SSI (11)	A (Cos)	A\ (Cos\)	B (Sin)	B\ (Sin\)	DATA	DATA\					CLK	CLK\			
SC Servo (12)	A (Cos)	A\ (Cos\)	B (Sin)	B\ (Sin\)	Z	Z\	U	U\	V	V\	W	W\			
BiSS (13)	DATA	DATA\	CLK	CLK\	Freeze	Freeze\									
Resolver (14)	Cos H	Cos L	Sin H	Sin L	Ref H	Ref L									
SC SC (15)	A (Cos)	A\ (Cos\)	B (Sin)	B\ (Sin\)	Z	Z\	C*[1]	C*[1]	D*[2]	D*[2]	Freeze2	Freeze2\			
Commutation Only (16)							U	U\	V	V\	W	W\			
SC BiSS (17)	A	A\	B	B\	DATA	DATA\					CLK	CLK\			

Figure 2 – UnidriveM/DigitaxHD Feedback Port Pinouts

4.14.4   Encoder connection details
Table 4-20   Drive encoder connector details

Terminal	Ab (0)	Fd (1)	Fr (2)	Ab.SErVO (3)	Fd.SErVO (4)	Fr.SErVO (5)	SC (6)	SC.HiPEr (7)	EndAt (8)	SC.EndAt (9)	SSI (10)	SC.SSI (11)
1	A	F	F	A	F	F	Cos			Cos		Cos
2	A\	F\	F\	A\	F\	F\	Cosref			Cosref		Cosref
3	B	D	R	B	D	R	Sin			Sin		Sin
4	B\	D\	R\	B\	D\	R\	Sinref			Sinref		Sinref
5	Z*							Encoder input - Data (input/output)				
6	Z*							Encoder input - Data\ (input/output)				
7	Simulated encoder Aout, Fout**			U			Simulated encoder Aout, Fout**					
8	Simulated encoder Aout\, Fout**			U\			Simulated encoder Aout\, Fout**					
9	Simulated encoder Bout, Dout**			V			Simulated encoder Bout, Dout**					
10	Simulated encoder Bout\, Dout**			V\			Simulated encoder Bout\, Dout**					
11				W					Encoder input - Clock (output)			
12				W\					Encoder input - Clock\ (output)			
13	+V***											
14	0V common											
15	th****											

Figure 3 – UnidriveSP Feedback Port Pinouts

ENDAT, SSI and BiSS all have the same pin configurations. BiSS is only compatible with the UnidriveM or DigitaxHD. It never was compatible with the Unidrive Classic or UnidriveSP. The chart below just focuses on the ENDAT encoder type. EnDat Alt consists of only the EnDat comms signals and as shown, match the SC.EnDAT pins. The communications are compatible with both EnDatT 2.1 and EnDat 2.2.   But with EnDat2.1, it is not possible to read both the position data and data via user comms at the same time. For this reason, it is not possible to use the electronic nameplate functions when using the EnDat Alt configuration with a EnDat 2.1 encoder (Technical Notification T190902).

As mentioned earlier, these new feedback selections were created so users upgrading to Unidrive M or Digitax HD can use the same feedback cable. The reason for this is that the Data and Clock signals were moved as shown in Figure 4. It is also possible that the user can select either SC.Endat or EnDat Alt to run the motor.

CONTROL TECHNIQUES

PIN	SC.EnDat	EnDat (SP)	EnDat (M/HD)	EnDat Alt
1	A		DATA	
2	A\		DATA\	
3	B		CLK	
4	B\		CLK\	
5	DATA	DATA		DATA
6	DATA\	DATA\		DATA\
7				
8				
9				
10				
11	CLK	CLK		CLK
12	CLK\	CLK\		CLK\
13	V Supply	V Supply	V Supply	V Supply
14	OV common	OV common	OV common	OV common
15	th	th	th	th

Figure 4 – Pinout Differences for EnDat Feedback Type