


Feedback System Integration Modules

SI-Encoder

	M100	M200	M300	M400	M600	M700
					✓	✓

SI-Encoder has an incremental encoder input to provide Closed loop Rotor Flux Control for induction motors (RFC-A) on M600 and an additional encoder input on M700.

Features include:

- Supports AB quadrature encoders without marker pulse



Terminal descriptions


1	2	3	4	5	6	7
---	---	---	---	---	---	---

Pin Number	Function
1	A
2	/A
3	B
4	/B
5	Power Supply +
6	Power Supply 0 V *1
7	Power Supply 0 V *1

*1: Two 0 V terminals are provided so that the shield of the encoder cable can be independently connected to 0 V without requiring dual wire (twin) crimp ferrules. This provides a system which is easier to wire and debug electrical noise issues.

FEEDBACK

SI-Universal Encoder

	M100	M200	M300	M400	M600	M700
					✓	✓

The dual encoder port on the Unidrive M700 supports two position feedback interfaces, P1 & P2, through a 15-way high density D-type connector. The SI-Universal Encoder complements this by enabling additional input and output formats to be used that could not otherwise be supported by the single 15 pin connector. It also provides Closed loop Rotor Flux Control for induction motors (RFC-A) on M600.

Features include:

Support for:

- SinCos with communications
- SinCos with or without commutation
- Quadrature incremental with or without commutation
- Pulse and direction
- SSI and EnDat

The module also provides a simulated encoder output that can be programmed to operate in the following modes:

- Quadrature incremental
- Pulse and direction
- SSI

The module also incorporates high speed inputs for position capture.

Functions		
P1 Position feedback interface	P2 Position feedback interface	Encoder simulation outputs
AB Servo FD Servo FR Servo SC Servo	None	None
AB FD FR	AB, FD, FR, EnDat, SSI	None
SC SC Hiperface	None	Full
SC EnDat SC SSI	AB, FD, FR (No Z marker pulse input)	None
	EnDat, SSI	
EnDat SSI	None	No Z marker pulse output
	AB, FD, FR	None
	EnDat, SSI	No Z marker pulse output
	None	Full

Position feedback device interface connections

The SI-Universal Encoder has two position feedback interfaces and an encoder simulation output on the 15-way D-type. The availability of the encoder simulation output and the 2nd position interface (P2) depends on the feedback device type selected for the 1st position interface (P1) as some feedback devices use all pins of the 15-way D-type.

The drive supports the following encoder types:

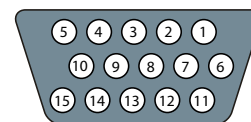
Position feedback device type	Drive name
Quadrature incremental encoders with or without marker pulse	AB
Frequency and direction incremental encoders with or without marker pulse	FD
Forward / reverse incremental encoders with or without marker pulse	FR
Quadrature incremental encoders with or without marker pulse and UVW commutation signals for absolute position for permanent magnet motors	AB Servo
Frequency and direction incremental encoders with or without marker pulse and UVW commutation signals for absolute position for permanent magnet motors	FD Servo
Forward / reverse incremental encoders with or without marker pulse and UVW commutation signals for absolute position for permanent magnet motors	FR Servo
Sincos incremental encoders with or without marker pulse	SC
Sick sincos encoders with Hiperface communications for absolute position	SC Hiperface
Heidenhain EnDat 2.1 or 2.2 communication only encoders	EnDat
Heidenhain sincos encoders with EnDat communication for absolute position	SC EnDat
SSI encoders (Gray code or binary)	SSI
Sincos encoders with SSI comms for absolute position (Gray code or binary)	SC SSI
Sincos incremental encoders with or without marker pulse and UVW commutation signals for absolute position for permanent magnet motors	SC Servo

The marker inputs can be used without their associated position feedback as freeze trigger inputs, therefore these are present where possible even if the associated incremental or SINCOS position feedback is not possible. The table below gives the connection functions associated with the codes used.

Connection Function	Connection Definition
Position Interface inputs	
A	A input for AB, or AB Servo encoders, F input for FD, FD Servo, FR or FR Servo encoders
B	B input for AB, or AB Servo encoders, D input for FD or FD Servo encoders, R input for FR or FR Servo encoders
Z	Z input for AB, AB Servo, FD, FD Servo, FR, FR Servo, SC encoders, Freeze input
U, V, W	Commutation signals for AB Servo, FD Servo, FR Servo, or SC Servo
Cos, Sin	Cosine and Sine inputs for SC, SC EnDat, SC Hiperface, SC SSI or SC Servo encoders
D	Data input/output for SC EnDat, SC Hiperface or EnDat encoders Data input for SC SSI, SSI encoders
Clk	Clock output for SC EnDat, SC SSI, EnDat or SSI encoders
Encoder Simulation Output	
AOut	A output for AB mode, F output for FD or FR modes, Data output for SSI Gray or SSI Binary modes
BOut	B output for AB mode, D output for FD or FR modes, Clock input for SSI Gray or SSI Binary modes
Zout	Z output for AB, FD or FR modes
Power Supply and Temperature Measurement	
PS1	Power supply output (13 = Supply, 14 = 0 V)
Th	Temperature measurement input

Terminal descriptions

The table below shows the functions that can be provided simultaneously, along with the connections required for each combination of functions.



D-type connector

Functions			Connections							
P1 Position feedback interface	P2 Position feedback interface	Encoder Simulation Output	1/2	3/4	5/6	7/8	9/10	11/12	13/14	15
AB Servo FD Servo FR Servo			A1	B1	Z1	U1	V1	W1	PS1	Th
SC Servo			Cos1	Sin1	Z1	U1	V1	W1	PS1	Th
AB, FD, FR	AB, FD, FR		A1	B1	Z1	A2	B2	Z2	PS1	Th
AB, FD, FR	EnDat, SSI		A1	B1	Z1	D2	Clk2	Z2	PS1	Th
AB, FD, FR		Full	A1	B1	Z1	AOut	BOut	ZOut	PS1	Th
SC	AB, FD, FR		Cos1	Sin1	Z1	A2	B2	Z2	PS1	Th
SC	EnDat, SSI		Cos1	Sin1	Z1	D2	Clk2	Z2	PS1	Th
SC		Full	Cos1	Sin1	Z1	AOut	BOut	ZOut	PS1	Th
SC Hiperface	AB, FD, FR		Cos1	Sin1	D1	A2	B2	Z2	PS1	Th
SC Hiperface	EnDat, SSI		Cos1	Sin1	D1	D2	Clk2	Z2	PS1	Th
SC Hiperface		Full	Cos1	Sin1	D1	AOut	BOut	ZOut	PS1	Th
SC EnDat SC SSI	AB, FD, FR No Z		Cos1	Sin1	D1	A2	B2	Clk1	PS1	Th
SC EnDat SC SSI	EnDat, SSI		Cos1	Sin1	D1	D2	Clk2	Clk1	PS1	Th
SC EnDat SC SSI		No Z marker pulse	Cos1	Sin1	D1	AOut	BOut	Clk1	PS1	Th
EnDat, SSI	AB, FD, FR		D1	Clk1	Z1	A2	B2	Z2	PS1	Th
EnDat, SSI	EnDat, SSI		D1	Clk1	Z1	D2	Clk2	Z2	PS1	Th
EnDat, SSI		Full	D1	Clk1	Z1	AOut	BOut	ZOut	PS1	Th
EnDat, SSI	EnDat, SSI	No Z marker pulse	D1	Clk1	D2	AOut	BOut	Clk2	PS1	Th

Blue text indicates P1 interface connections | Green text indicates P2 interface connections | Red text indicates encoder simulation output connections | A1 means A = Pin1, A\ = Pin2

Screw terminal connector

Terminal	Description
1	24 V Freeze input
2	0 V
3 (7)	Encoder simulation output: A, F or DATA P2 input: A, F, DATA
4 (8)	Encoder simulation output: A\, F\ or DATA\ P2 input: A\, F\, DATA\
5 (9)	Encoder simulation output: B, F, D or Clock P2 input: B, F, D, Clock
6 (10)	Encoder simulation output: B\, F\, D\ or Clock\ P2 input: B\, F\, D\, Clock\
7	0 V
8 (11)	Encoder simulation output: Z P2 input: Z
9 (12)	Encoder simulation output: Z\ P2 input: Z\
10 (13)	Power supply output

1	2	3	4	5
6	7	8	9	10

The termination resistors are always enabled on the P2 position interface. Wire break detection is not available when using AB, FD or FR position feedback device types on the P2 position interface.

The value in brackets corresponds to the pin on the 15-way D-type to which this terminal is connected.