

HTTL Speed Feedback Technology Box

Technical Manual HA467427U001 Issue 2

Compatible with Version 1.x Software

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Safety Information



Please read this information BEFORE installing the equipment.

Intended Users

This manual is to be made available to all persons who are required to install, configure or service equipment described herein, or any other associated operation.

The information given is intended to highlight safety issues, and to enable the user to obtain maximum benefit from the equipment.

Application Area

The equipment described is intended for industrial motor speed control utilising AC/DC induction or synchronous machines.

Personnel

Installation, operation and maintenance of the equipment should be carried out by qualified personnel. A qualified person is someone who is technically competent and familiar with all safety information and established safety practices; with the installation process, operation and maintenance of this equipment; and with all the hazards involved.

REFER TO YOUR MAIN PRODUCT MANUAL FOR SPECIFIC SAFETY INFORMATION ABOUT THE DEVICE YOU ARE CONTROLLING

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HTTL SPEED FEEDBACK OPTION

Description

The HTTL Speed Feedback option (Part No. AH467407U001) allows incremental encoders to be connected directly to the motor controller to provide highly accurate speed feedback measurement.

Features

The option has the following features:

- Contains two optically isolated differential inputs on channels A and B
- Decoding logic to interface the encoder to the microprocessor
- Supplies variable voltage, isolated encoder power supply

Used On

• This option can be used on 690+ Inverters with the following Product Codes:

690P/0015/230/1/.. 690P/0022/230/3/.. 690P/0040/230/3/.. 690P/0007/400/3/.. 690P/0015/400/3/.. 690P/0022/400/3/..

Refer to the 690+ Inverter Installation Product Manual, Chapter 2 for Product Code details.

Specifications

Maximum Pulse Rate	250kHz		
Receiver Current	≤10mA per channel		
Input Format	Two differential channels in quadrature		
Phase displacement	>1µs		
Differential Input Voltage	±30V maximum		
Encoder Supply	Maximum load = 250mA or 2.5W, whichever is smaller. Voltage adjustable approximately 10-20V by firmware		
Terminal Wire Size (maximum)	16 AWG		
Terminal Tightening Torque	0.2Nm (1.75 pound-inches)		

Recommended Spare Parts

We recommend that you keep one option as a spare to reduce down-time.

Wiring the System

WARNING!

Disconnect all sources of power before attempting installation. Injury or death could result from unintended actuation of controlled equipment.

Caution

This option contains ESD (Electrostatic Discharge) sensitive parts. Observe static control precautions when handling, installing and servicing this option.

Figure 1 The HTTL Speed Feedback Option

The option is factory-fitted using correct static safety procedures. The cable tie loop is used to secure the connecting cable so that it doesn't obstruct the LED light pipes used by the Comms Technology Option.

DIP Switch Settings

The DIP switch settings control the following inputs:

Input Threshold					
Switch Number	1	2			
Input Controlled	Α	В			
3V±1	On	On			
8V±1	Off	Off			



Usually the switches will be set to give a threshold of 3V when using a differential encoder (as shown), and to 8V when using a single-ended encoder. (Factory default is with switches 1 & 2 set in the UP position - 3V).



Terminal Block (TB1) Connections



Note: The GND connection shown above is the screen connection, some encoder manufacturers use a different terminology.

For correct operation, A, /A, B and /B **must** be connected as shown. If any is left unconnected, the HTTL speed feedback technology box will not operate.

Take special care wiring the encoders to the option due to the low level of the signals.

All wiring to the Speed Feedback option should be made in screened cable. Preferably, use cable with an overall screen and a screen over each individual pair. To ensure compliance with the EMC Directive the overall cable screen should be connected to the encoder body and to the cable clamp.

Recommended cable:

Belden equivalent 8164 - overall screen and pairs individually screened Belden equivalent 8777 - pairs individually screened, Eurotherm Part No CM052666

Initial Set-up

MMI Menu Map

- 1 SETUP
- MOTOR CONTROL
- 3 FEEDBACKS

ENCODER SUPPLY ENCODER LINES ENCODER INVERT QUADRATIC TORQUE DC LINK VOLTS TERMINAL VOLTS SPEED FBK RPM SPEED FBK HZ SPEED FBK % ENCODER COUNT TORQUE FEEDBACK FIELD FEEDBACK MOTOR CURRENT % MOTOR CURRENT A

Using the Operator Station (MMI) or other suitable PC programming tool, this function block requires configuring before the HTTL option can be used.

ConfigEd Lite is Eurotherm Drives' Windows-based block programming software.

Ranges for some outputs are given as indeterminate integer for the value, to two decimal places.

Note that only parameters relevant to the Encoder are described below.

Parameter Descriptions

ENCODER SUPPLY

Set this to the supply voltage required by the encoder.

ENCODER LINES

The number of lines must be set to match the type of encoder being used. Incorrect setting of this parameter will result in an erroneous speed measurement.

**

** Set to a value depending on the overall "power build" of the Inverter.

ENCODER INVERT

Used to match the encoder direction to the motor direction. When TRUE, it changes the sign of the measured speed and the direction of the position count.

It is especially necessary to set up this parameter when in CLOSED-LOOP VEC mode, as the encoder direction must be correct for this mode to operate.

SPEED FEEDBACK RPM

The mechanical speed of the motor shaft in revolutions per minute.

SPEED FEEDBACK HZ

This parameter changes according to the CONTROL MODE (MOTOR DATA function block):

- In CLOSED-LOOP VEC mode, or SENSORLESS VEC mode, the parameter shows the • mechanical speed of the motor shaft in revolutions per second.
- In VOLTS / Hz mode, the parameter shows the drive output frequency.

SPEED FEEDBACK %

Shows the mechanical speed of the motor shaft as a percentage of the user maximum speed setting (MAX SPEED in the SETPOINT SCALE function block).

(increments/decrements @ 4 x line rate, i.e. 1 revolution = 4000 for a 1000 line encoder) This is a 16-bit register which is incremented or decremented by the pulses from the encoder. It is useful to check that the encoder is operating, and to measure the encoder lines, if this is not known. Rotate the motor shaft through 1 revolution and note the difference between readings at the start and finish. The difference should be 4 times the encoder lines. For greater accuracy, rotate the shaft through several revolutions.

The direction of count is unaffected by ENCODER INVERT.

Configuring the 690+ Inverter

	-	DC LINK VOLTS [75]		⊢	0 V	
	_	TERMINAL VOLTS [1020]			\vdash	0 V
	-	SPEED FEEDBACK [569]			┝	0.00 rpm
			RPM			
	-	SPEE	ED FEEDBACK HZ	[568]	\vdash	0.00 Hz
	-	SPE	ED FEEDBACK %	[749]	\vdash	0.00 %
	-	E	NCODER COUNT	[1016]	┝	0
	-		TORQUE FBK	[70]	\vdash	0.00 %
	-		FIELD FBK	[73]	┝	0.00 %
	-	MO	TOR CURRENT %	[66]	┝	0.00 %
	-	N	IOTOR CURRENT	[67]	\vdash	0.0 A
10.0 V	-	[761]	ENCODER SUPPLY		F	
** 2048	-	[566]	ENCODER LINES		F	
FALSE	_	[567]	ENCODER INVERT		F	
FALSE	_	[50]	QUADRATIC TORO	UE	L	

Feedbacks

Range: 10.0 to 20.0V

Range: 250 to 1000000

Range: FALSE/TRUE

Range: —.xx rpm

Eurotherm Drives Approved Encoders

Recommended Encoder	Hengstler:	RI 58TD//2048ED.37IF		
(12mm bore)	Eurotherm Drives Part Number:	DD464475U012		
Alternative Encoders	Hengstler:	RI 76TD/2048ED-4N20IF		
(20mm bore)	Eurotherm Drives Part Number:	DD464475U020		

Encoders are available from Hengstler in other accuracy's such as 500 lines/rev or 2000 lines/rev to suit the application.