HTTL Speed Feedback Technology Box

Technical Manual

HA467427U001 Issue 3

Compatible with Version 1.x Software

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/..
690P/0040/400/3/..

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	$>1\mu s$
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.

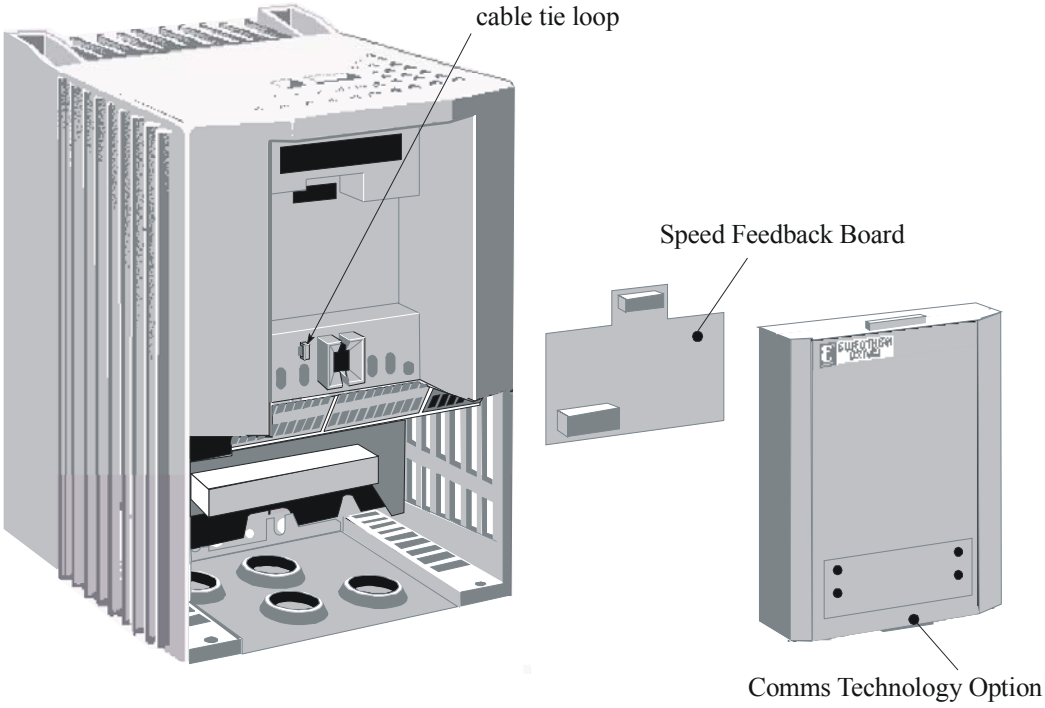


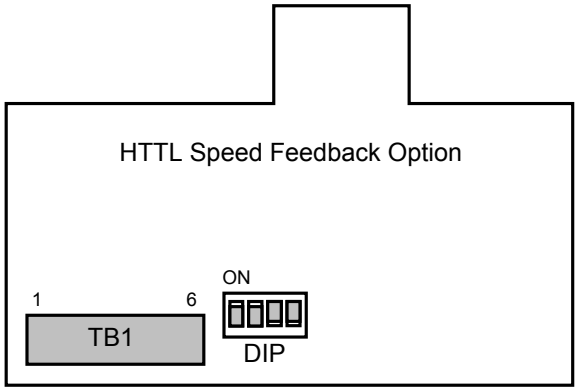
Figure 1 The HTTL Speed Feedback Option

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.

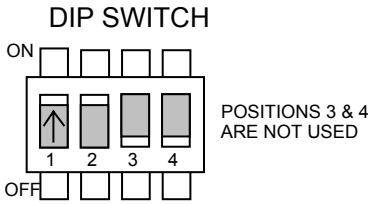
DIP Switch Settings

The DIP switch settings control the following inputs:

Input Threshold		
Switch Number	1	2
Input Controlled	A	B
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

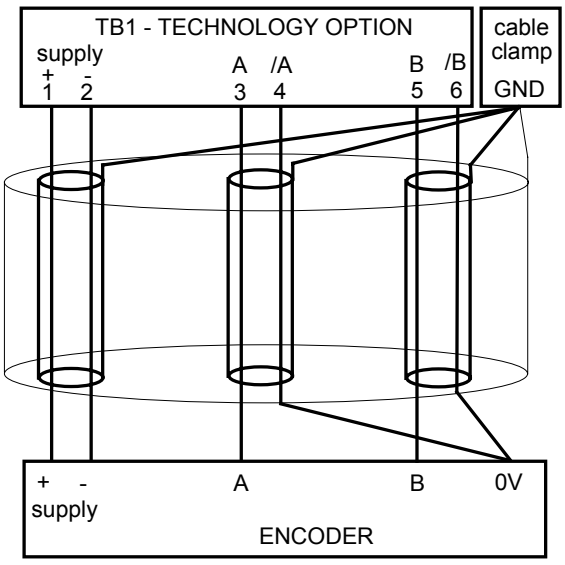


Figure 3 Single-Ended Encoder Outputs

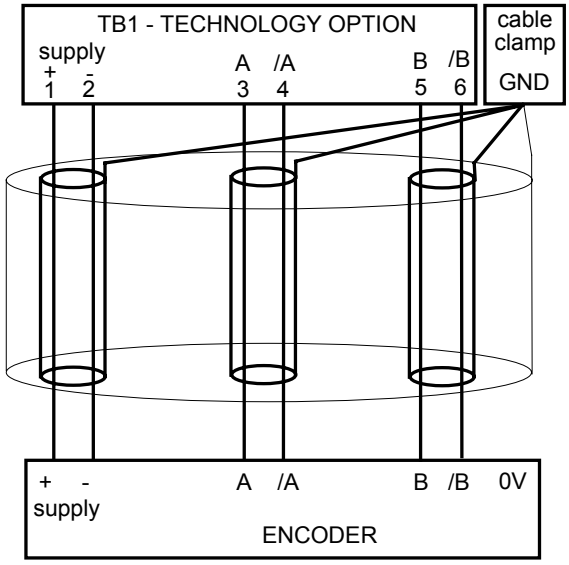


Figure 2 Differential Encoder Outputs

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, SSD Drives Part No CM052666

Configuring the 690+ Inverter

MMI Menu Map

1 SETUP

2 MOTOR CONTROL

3 FEEDBACKS

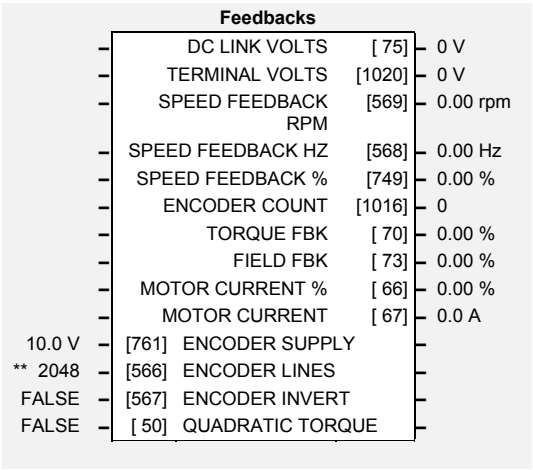
- ENCODER SUPPLY
- ENCODER LINES
- ENCODER INVERT
- QUADRATIC TORQUE
- DC LINK VOLTS
- TERMINAL VOLTS
- SPEED FBK RPM
- SPEED FBK HZ
- SPEED FBK %
- ENCODER COUNT
- TORQUE FEEDBACK
- FIELD FEEDBACK
- MOTOR CURRENT %
- MOTOR CURRENT A

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 SSD Drives' Windows-based block programming software.

Ranges for some outputs are given as "—.xx %", for example, indicating an indeterminate integer for the value, to two decimal places.

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



Parameter Descriptions

ENCODER SUPPLY *Range: 10.0 to 20.0V*

Set this to the supply voltage required by the encoder.

ENCODER LINES *Range: 250 to 1000000*

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 *Range: FALSE/TRUE*

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 *Range: —.xx rpm*

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

SPEED FEEDBACK HZ *Range: —.xx 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 % *Range: —.xx %*

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).

ENCODER COUNT *Range: —.*

(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.

SSD Drives Approved Encoders

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

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

ISS.	MODIFICATION	ECN No.	DATE	DRAWN	CHK'D
1	Initial Issue (HA467427U001)	13695	17/5/00	CM	AFL
2	Factory settings changed for option switches Removed screen connections to encoder body in diagrams on page 9.	17759 (16449)	03/11/03	CM	AFL
3	Company name change	18354	26/10/05	CM	AFL

FIRST USED ON	MODIFICATION RECORD HTTL Speed Feedback Option	
SSD DRIVES	DRAWING NUMBER ZZ467427C001	SHT. 1 OF 1