1541-12 INTELLIGENT RESOLVER INTERFACE MODULE

Overview

Utilizing licensed Allen-Bradley SLC 500 I/O interface technology, the 1541-12 Resolver Interface Module is a one transducer input module that plugs directly into any I/O slot of the A-B SLC 500 racks. Communicating through registers assigned to the slot, this module supplies absolute position and velocity data to A-B SLC processors from an ultra-reliable resolver based transducer. This manual explains the installation and operation of the 1541-12 Resolver Interface Module. This module offers a position resolution of 5000 counts per turn and a tachometer resolution of 0.1 RPM. The tachometer has a sample period of 32 mSec with an update time of 4 mSec.

Front Panel Description

Two LED's on the front panel show the operating status of the module.

RUN - This green LED is on when the module is operational.

FAULT - This red LED is on when there is a module fault, blinking when there is a transducer fault. There are four major causes of a transducer fault.

- Broken transducer cable.
- Non-compatible transducer.
- Improperly wired transducer cable.
- Faulty transducer.

The transducer input connector, located behind the module door, accepts the 8 pin Phoenix connector from the transducer cable. The 1541-12 uses the following transducers:

- HT-20
- HT-20S
- HT-20A
- H25SE
- H25FE
- HT-20-(x)

The 1541-12 uses the C1T-(x) cable for all transducers except the HT-20A. For this transducer, use the C1TA-(x) cable. The *Brushless Resolver Transducers* companion guide gives specifications, outline drawings, and cabling diagrams for the compatible transducers.
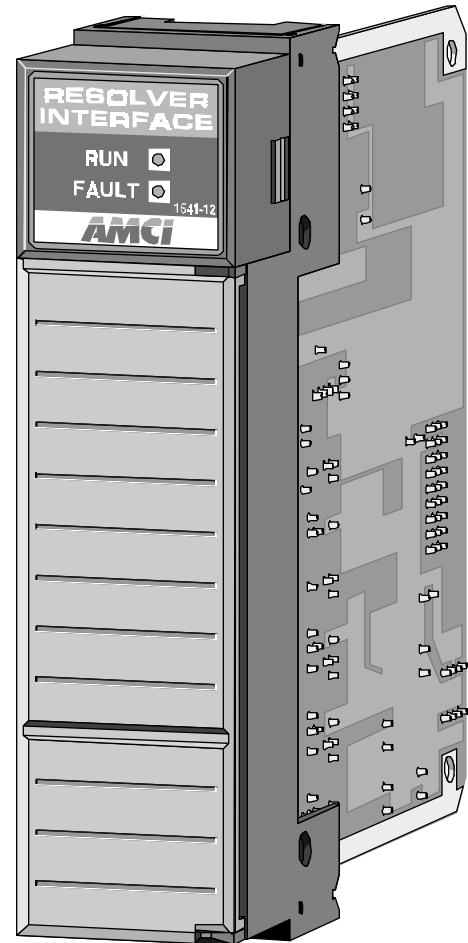

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Installation

Power Requirements

The 1541-12 module requires 0.130A @ 5Vdc and 0.075A @ 24Vdc. Add this to the current requirements of your system. Note that this limits the use of some cards with the 1541-12 in fixed SLC 500 systems.

Tachometer Response

The 1541-12 presents new tachometer data to the SLC every 4 mSec with 0.1 RPM resolution. This data is the average velocity of the transducer for the previous 32 mSec period.

Cable Installation

Cable installation guidelines, and diagrams are given in the *Brushless Resolver Transducers* companion guide. The 1541-12 uses the C1TA-(x) for the HT-20A and the C1T-(x) for all others.

Transducer Installation

Transducer specifications, mounting guidelines, and outline drawings are given in the *Brushless Resolver Transducers* companion guide. The 1531 and 1532 Module are compatible with the HT-20, HT-20S, HT-20A, H25SE, H25FE, and HT-20-(x) transducers.

Rack Installation

You can install the 1541-12 module in any free slot as long as power requirements are met. Align the module's circuit board with the top and bottom card guides in the rack and gently slide the module into the rack until the top and bottom latches secure the module in place.

To remove the module, depress the top and bottom latches and slide the module out of the rack.

Software Configuration

Before the 1541-12 can communicate with the SLC™ processor, you must program the proper *ID Code* into the programmable controller's *processor file* using a Hand Held Terminal or APS software. **The ID Code for all 1500 Modules is 3513**. This ID Code reserves 8 Input and 8 Output words for the 1541-12 Module. Refer to your A-B manuals for explicit instructions on entering ID Codes with the HHT or APS software. If you are using ICOM's A.I. Series™ Programming Software it must be version 7.03 or above. A lower version number will not allow you to set an ID code as high as 3513. **NOTE:** Use the SPIOGA configuration option to reduce the number of Input Words to three and the number of Output Words to two. This will significantly decrease the access time for the module.

Data Format

The format of the fault diagnostic, position, and tachometer data is shown below. A fault diagnostic bit is set to "1" when indicating an error. Position and tachometer data is transferred in binary format.
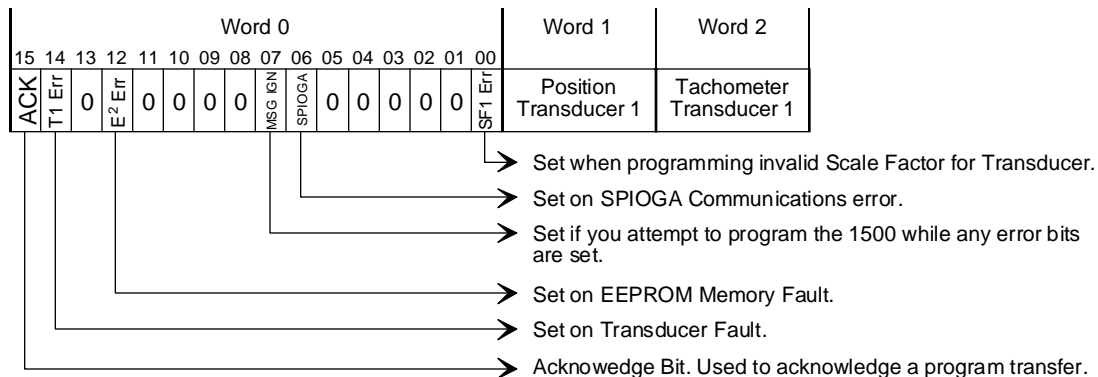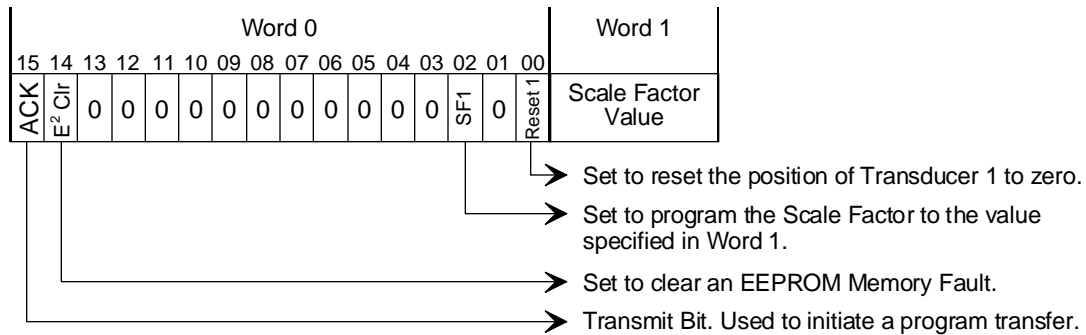

WORDS 3-7 RESERVED: Set to Zero.

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Programming from the Processor

You can use the Output Words assigned to the 1541-12 to control the module from the processor. With these words you can:

- Clear an EEPROM Memory Error.
- Change the Scale Factor (counts per turn). Valid range: 2 - 5000
- Reset the position value to zero.

The format of the 8 Output Words is shown in the following figure.

WORDS 2-7 RESERVED: Set to Zero.

To program the module, simply write the Scale Factor in Word 1 (if you're changing it), set the proper bits in Word 0, and then set the TRMT Bit to 1. The 1541-12 accepts new commands only on a 0→1 transition of the TRMT bit. The 1541-12 will process the commands in the following order:

- Clear EEPROM Memory Fault
- Program Scale Factor for Transducer 1
- Reset Transducer 1

Once the 1541-12 has accepted and processed the commands, it will set/reset the appropriate fault diagnostic bits and then set the ACKnowledge Bit. Once the ACK bit is set, check the error bits in Word 0 of the Input Registers and then write 0000 into Word 0 of the Output Registers. This resets the TRMT bit. The module will respond by resetting the ACK bit. The programming cycle is now complete and a new cycle can begin.

NOTE: If the 1541-12 encounters an error, it will stop processing the commands. For example, you command the module to change the Scale Factor and reset the position value in a single cycle. The Scale Factor is set to 5120. (Outside the valid range of 2-5000.) The module will respond by setting the 'SF1 Err' Bit. The Scale Factor will be ignored and the position value will not be reset to zero.

⚠️ **WARNING** The EEPROM is guaranteed for approximately 10,000 write cycles before writing to it will cause a fault. Therefore continuously resetting the position or writing a new scale factor should be avoided. If your application requires you to continuously reset the position, consider calculating and applying the required position offset in the PLC program.

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Revision Record

This revision, 940-55070, is the first release of the electronic version of this manual. It was first released 10/14/98.