

# Feedback Interface Types

Feedback interface technologies include:

- Digital AqB (digital A quad B signals)
- Sine/Cosine (analog A quad B signals)
- Digital Parallel (parallel digital bit interface)
- SSI (Synchronous Serial Interface)
- LDT (Linear Displacement Transducer)
- Resolver

Other modern feedback interfaces supported are: Hiperface and Hiperface DSL (by Stegmann) and EnDat 2.1 and EnDat 2.2 (by Heidenhain). The Usage column for a feedback attribute is based on the context of the Feedback Type. Abbreviations for the various Feedback Types are defined in this table:

## Feedback Type abbreviations

Abbreviation	Feedback Type
TT	Digital AqB
TP	Digital Parallel
SC	Sine/Cosine
HI	Hiperface
HD	Hiperface DSL
ED	EnDat 2.1 and 2.2
INT	Integrated
RS	Resolver
SS	SSI
LT	LDT - Linear Displacement Transducer
TM	Tamagawa
SL	Stahl SSI

This section defines the minimal set of required attributes to support CIP Motion device interchangeability. This guarantees that there is sufficient parametric data provided by the controller for any CIP Motion compliant drive to effectively interface to a wide range of feedback device types.

Multiple feedback device interfaces are currently defined by the Motion Control Axis per axis to serve specific control or master feedback functions. These feedback devices are accessed using their assigned logical channels, for example, Feedback 1 and Feedback 2. Each logical feedback channel is mapped to a physical feedback interface port of the device, for example Port 1, and Port 2.

## Logical Feedback Channel Control Functions

🔍
⚙️

- ▷ [Quick Start Steps](#)
- ▷ [Logix Designer](#)
- ▷ [Module Information](#)
- ◀ [Instruction Set](#)
  - [Logix 5000 Controllers](#)
  - [Instruction and Application Considerations](#)
  - [Logix Designer Application Instruction Set](#)
  - [Interpret the Attribute Tables](#)
  - [Array Concepts](#)
- ◀ [CIP Axis Attributes](#)
  - [AXIS\\_CIP\\_DRIVE Diagrams](#)
  - [AXIS\\_CIP\\_DRIVE Structure](#)
  - ▷ [Accessing Attributes](#)
    - [AC Line Condition Attributes](#)
    - [Acceleration Control Attributes](#)
    - [Acceleration Control Configuration Attributes](#)
    - [Additional Error Code Information](#)
  - ▷ [APR Fault Attributes](#)
    - [Auto-Tune Configuration Attributes](#)
  - ▷ [Axis Exception Action Configuration Attributes](#)
    - [Axis Info Attributes](#)
    - [Axis Safety Status Attributes](#)
    - [Axis Statistical Attributes](#)
    - [CIP Axis Status Attributes](#)
    - [CIP Error Codes](#)
    - [CIP Motion Axis Control Modes](#)
  - ▷ [Command Reference Generation Attributes](#)
    - [Configuration Fault Attributes](#)
    - [Control Mode Attributes](#)
    - [Converter AC Line Configuration Attributes](#)
    - [Converter AC Line Monitoring Attributes](#)
    - [Converter AC Line Source Configuration Attributes](#)
    - [Converter Bus Voltage Control Configuration Attributes](#)
    - [Converter Bus Voltage Control Signal Attributes](#)
    - [Converter Control Mode Attributes](#)

[Attributes](#)

Logical Feedback Channel	Motion Control Function	Master Feedback Function
Feedback 1	Motor Feedback and Commutation	Master Feedback 1
Feedback 2	Load-side Feedback	Master Feedback 2
Feedback 3	Vendor Specific	Vendor Specific
Feedback 4	Vendor Specific	Vendor Specific
Feedback 3 (Rockwell Automation)	Redundant Motor Feedback	Redundant Master Feedback 1
Feedback 4 (Rockwell Automation)	Redundant Load-side Feedback	Redundant Master Feedback 2

When the Control Mode is set to something other than No Control, Feedback 1 is associated with the motor mounted feedback device while Feedback 2 is associated with the load-side or machine mounted feedback device. Feedback 1 is always required for PM Motor commutation.

When Control Mode is set to No Control for a Motion Control Axis, different logical feedback channels can be used as the master feedback source, for example, Feedback 1 and Feedback 2. Generally, Feedback 1 is used.

For Rockwell Automation devices Feedback 3 is used to provide a redundant logical feedback channel for Feedback 1 while Feedback 4 is used to provide a redundant logical channel for Feedback 2.

To minimize the length of the feedback attribute tables below, the letter *n* in the generic Feedback *n* attribute name is used to specify the associated feedback channel number. Valid channel numbers for open standard feedback attributes of the Motion Control Axis are 1, 2, 3 and 4.

Attribute IDs are assigned based on the channel number. Support for feedback interface channels 1, 2, 3 and 4 are optional in the device implementation. If no feedback interface channel is present in the device the associated set of feedback channel attributes are not applicable.

However, if hardware support for any of these feedback channels is available in a given device, these attributes are clearly applicable in the implementation and will follow the Usage rules. A Usage rule of 'Req - E' or 'Opt - E' indicates that the attribute is generally applicable to all Device Control Codes where the feedback channel itself is applicable, hence the 'E' for Encoder.

If a specific logical feedback channel, feedback *n*, is not applicable based on the current feedback configuration, then attributes for feedback *n* are not applicable; no feedback configuration attributes for that channel are set by configuration software, nor are any such attributes sent to the drive device. This table outlines these rules:

Feedback Configuration	Feedback 1	Feedback 2
No Feedback	No	No
Master Feedback	Yes	No
Motor Feedback	Yes	No

- [Converter Current Control Configuration Attributes](#)
- [Converter Current Control Signal Attributes](#)
- [Converter Current Reference Configuration Attributes](#)
- [Converter Current Reference Signal Attributes](#)
- [Converter Output Attributes](#)
- [Converter Reactive Power Control Attributes](#)
- [Converter Types](#)
- [Current Control Signal Attributes](#)
- [Current Control Configuration Attributes](#)
- [Cyclic Read and Cyclic Write DC Bus Condition Attributes](#)
- [Device Function Codes](#)
- [Device Commissioning Attributes](#)
- [Drive General Purpose I/O Attributes](#)
- [Drive Output Attributes](#)
- [Drive Parameters](#)
- [Event Capture Attributes](#)
- [Exception Factory Limit Info Attributes](#)
- [Exception User Limit Configuration Attributes](#)
- [Exception, Fault and Alarm Attributes](#)
- [Exceptions](#)
- [Fault and Alarm Behavior](#)
- [Feedback Interface Types](#)
- [Feedback Configuration Attributes](#)
- [Frequency Control Configuration Attributes](#)
- [Frequency Control Signal Attribute](#)
- [General Feedback Info Attributes](#)
- [General Feedback Signal Attributes](#)
- [General Linear Motor Attributes](#)
- [General Motor Attributes](#)
- [General Permanent Magnet Motor Attributes](#)
- [General Rotary Motor](#)

Load Feedback	Yes <sup>(1)</sup>	Yes
Dual Feedback	Yes	Yes
Dual Integrator Feedback	Yes	Yes

<sup>(1)</sup>Feedback 1 channel is needed for commutation of PM Motors.

## Attributes

- [Guard Safety Attributes](#)
- [Guard Safety Status](#)
- [Attributes](#)
- [Hookup Test Configuration](#)
- [Attributes](#)
- [Hookup Test Result](#)
- [Attributes](#)
- [Identify Motion Axis](#)
- [Attributes Based on Device Function Codes](#)
- [Induction Motor Attributes](#)
- [Inertia Test Configuration](#)
- [Attributes](#)
- [Inertia Test Result](#)
- [Attributes](#)
- [Initialization Faults](#)
- [Attributes](#)
- [Interior Permanent Magnet Motor Attributes](#)
- [Linear PM Motor Attributes](#)
- [Load Transmission and Actuator Attributes](#)
- [Local Mode Configuration Attribute](#)
- [Module/Node Fault and Alarm Attributes](#)
- ▷ [Motion Control Axis Behavior Model](#)
- [Motion Control Configuration Attributes](#)
- [Motion Control Interface Attributes](#)
- [Motion Control Methods](#)
- [Motion Control Modes](#)
- [Motion Control Signal Attributes](#)
- [Motion Control Status Attributes](#)
- [Motion Database Storage Attributes](#)
- [Motion Dynamic Configuration Attributes](#)
- [Motion Fault and Alarm Exceptions](#)
- [Motion Homing Configuration Attributes](#)
- [Motion Instruction Compatibility](#)
- [Motion Planner Configuration Attributes](#)
- [Motion Planner Output Attributes](#)
- ▷ [Motion Scaling Attributes](#)
- [Motor Attributes](#)

## See also

- [General Feedback Info Attributes](#)
- [General Feedback Signal Attributes](#)
- [Feedback Configuration Attributes](#)

[MOTOR ATTRIBUTES MODELS](#)

- [Motor Test Result](#)
- [Attributes](#)
- [No Control Mode](#)
- [Position Control Mode](#)
- [Position Loop Signal](#)
- [Attributes](#)
- [Position Loop Configuration Attributes](#)
- [Power and Thermal Management Configuration Attributes](#)
- [Power and Thermal Management Status Attributes](#)
- [Replicated Attributes](#)
- [Required vs. Optional Axis Attributes](#)
- [Reset an APR Fault](#)
- [Rockwell Automation Specific CIP Axis Alarm Names](#)
- [Rockwell Automation Specific Exceptions](#)
- [Rockwell Automation Specific CIP Axis Fault Names](#)
- [Rockwell Automation Specific Initialization Faults](#)
- [Rockwell Automation Specific Start Inhibits](#)
- [Rotary PM Motor Attributes](#)
- [Standard CIP Axis Fault and Alarm Names](#)
- [Standard Exceptions](#)
- [Rotary PM Motor Attributes](#)
- [Standard Initialization Faults](#)
- [Standard Start Inhibits](#)
- [Start Inhibits Attributes](#)
- [State Behavior](#)
- ▷ [Stopping and Braking Attributes](#)
- [Torque Control Mode](#)
- [Torque/Force Control Configuration Attributes](#)
- [Torque/Force Control Signal Attributes](#)
- [Velocity Control Mode](#)
- [Velocity Loop Configuration Attributes](#)
- [Velocity Loop Signal Attributes](#)
- ▷ [Module Configuration Attributes](#)

[Bit Addressing](#)[Common Attributes](#)[Data Conversions](#)[Elementary data types](#)[LINT data types](#)[Floating Point Values](#)[Immediate values](#)[Index Through Arrays](#)[Math Status Flags](#)[Motion Error Codes \(.ERR\)](#)[Structures](#)

- ▷ [Equipment Sequence instructions](#)

- ▷ [Equipment Phase Instructions](#)

- ▷ [Alarm Instructions](#)

- ▷ [Advanced Math Instructions](#)

- ▷ [Array\(File\)/Misc Instructions](#)

- ▷ [Array\(File\)/Shift Instructions](#)

- ▷ [ASCII Conversion Instructions](#)

- ▷ [ASCII Serial Port Instructions](#)

- ▷ [ASCII String Instructions](#)

- ▷ [Bit Instructions](#)

- ▷ [Compare Instructions](#)

- ▷ [Debug Instructions](#)

- ▷ [Drives Instructions](#)

- ▷ [Drive Safety Instructions](#)

- ▷ [For/Break Instructions](#)

- ▷ [Filter Instructions](#)

- ▷ [Function Block Attributes](#)

- ▷ [Structured Text Attributes](#)

- ▷ [Compute/Math Instructions](#)

- ▷ [Move/Logical Instructions](#)

- ▷ [Input/Output Instructions](#)

- ▷ [License Instructions](#)

- ▷ [Math Conversion Instructions](#)

- ▷ [Metal Form Instructions](#)

- ▷ [Motion Configuration Instructions](#)

- ▷ [Motion Event Instructions](#)

- ▷ [Motion Group Instructions](#)

- ▷ [Motion Move Instructions](#)

- ▷ [Motion State Instructions](#)

- ▷ [Multi-Axis Coordinated Motion Instructions](#)

- ▷ [Logical and Move Instructions](#)

- ▷ [Program Control Instructions](#)

- ▷ [Sequencer Instructions](#)

- ▷ [Special Instructions](#)

- ▷ [Timer and Counter Instructions](#)

- ▷ [Trigonometric Instructions](#)

- ▷ [Process Control Instructions](#)

- ▷ [Select/Limit Instructions](#)
- ▷ [Sequential Function Chart \(SFC\) Instructions](#)
- ▷ [Statistical Instructions](#)
- ▷ [Safety Instructions](#)
- ▷ [Studio 5000 Logix Designer Glossary](#)

Copyright © 2019 Rockwell Automation Technologies, Inc. All Rights Reserved.

[How are we doing?](#)