

Modules Subsystems

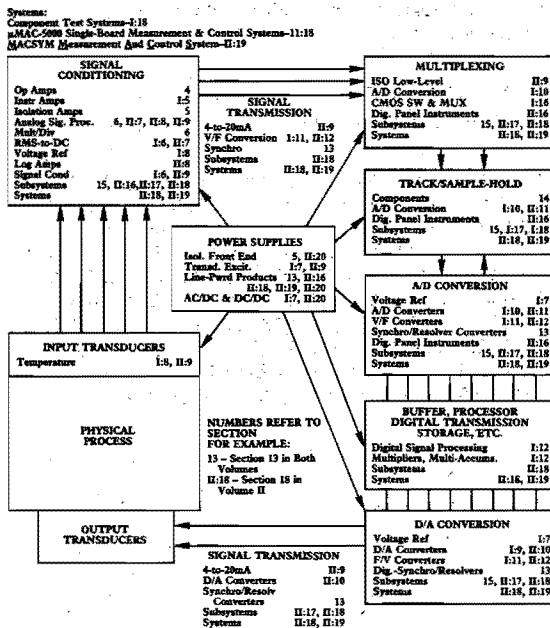




DATA-ACQUISITION DATABOOK 1984

VOLUME II MODULES-SUBSYSTEMS

PICTORIAL GUIDE TO PRODUCT CATEGORIES



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DATA-ACQUISITION DATABOOK 1984

VOLUME II MODULES-SUBSYSTEMS

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Products in this book may be covered by one or more of the following patents. Additional patents are pending. See individual data sheets for further information:

U.S.: 3,007,114, 3,278,736, 3,355,670, 3,441,913, 3,467,908, 3,500,218, 3,530,390, 3,533,002, 3,685,045, 3,729,660, 3,747,088, 3,793,563, 3,803,590, 3,842,412, 3,868,583, 3,872,466, 3,887,863, 3,890,611, 3,906,486, 3,909,908, 3,932,863, 3,940,760, 3,942,173, 3,946,324, 3,950,603, 3,961,326, 3,978,473, 3,979,688, 4,016,559, 4,020,486, 4,029,974, 4,034,366, 4,054,829, 4,092,698, 4,123,698, 4,136,349, 4,141,004, 4,213,806, 4,250,445, 4,270,118, 4,268,759, 4,286,225, 4,309,693, 4,313,083, 4,323,795, 4,338,591, 4,349,811, 4,363,024, 4,374,314, 4,383,222, 4,395,647, 4,399,345, 4,400,689, 4,400,690, DES 233,909. U.K.: 964,513, 1,310,591, 1,310,592, 1,364,233, 1,470,673, 1,470,674, 1,537,542, 1,531,931, 1,571,869, 1,590,136, 1,590,137, 1,599,538, 2,008,876, 2,012,135, 2,032,659, 2,040,087, 2,050,740, 2,081,040. France: 70.10561, 71.28952, 74.25263, 75-27557, 76 01788, 76 08238, 77 20799, 79 24021, 80 00960, 111 833. West Germany: 20 14 034, 21 39 560, MR 9379. Italy: 933,798. Japan: 452,263, 1,092,928, 1,101,824, 1,180,463. Canada: 984,015, 1,006,236, 1,025,558, 1,035,464, 1,054,248, 1,141,034, 1,141,820, 1,143,306, 1,150,414, 1,153,607, 1,157,571. Sweden: 7603320-8.



Low Profile Synchro/Resolver-to-Digital Converter

SDC1700/1702/1704 SERIES

FEATURES

- Internal Microtransformers for 60Hz, 400Hz and 2.6kHz References
- Low Profile (0.4")
- 10-, 12- or 14-Bit Resolution for 360°
- High Tracking Rates (75 revs/sec)
- Voltage Scaling with External Resistors (Unique, Feature)
- DC Voltage Output Proportional to Angular Velocity
- Low Cost
- Lightweight 3oz. (85 grams)
- MIL Spec/Hi Rel Options Available

APPLICATIONS

- Servo Mechanisms
- Retransmission Systems
- Coordinate Conversion
- Antenna Monitoring
- Simulation
- Industrial Controls
- Fire Control Systems
- Machine Tool Control Systems

GENERAL DESCRIPTION

The SDC1700, SDC1702 and SDC1704 are modular, continuous tracking Synchro/Resolver-to-Digital Converters which employ a type 2 servo loop.

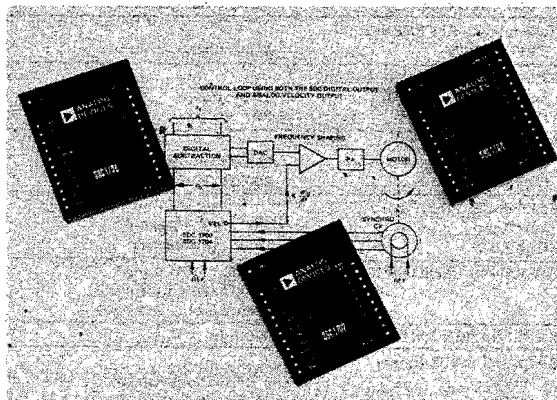
They are intended for use in both Industrial and Military applications.

The input signals can be either 3 wire synchro plus reference or 4 wire resolver plus reference, depending on the option. The outputs will be presented in TTL compatible, parallel natural binary.

One of the outstanding features of the converters is the use of precision Scott T and reference microtransformers. *This has made it possible to include the transformers within the module, even on the 60Hz option, and yet still maintain the profile height of 0.4".*

Particular attention has been paid in the design, to achieving the highest tracking rates and accelerations possible, compatible with the resolution and carrier frequency used, while at the same time obtaining a high overall accuracy.

When SDC's are used in control loops, it is often useful to have a voltage which is proportional to angular velocity. This voltage is available and has been brought out on all the SDC1700 converters.



Extended temperature range versions of all the converters are available.

MODELS AVAILABLE

The three Synchro-to-Digital Converters described in this data sheet differ primarily in the areas of resolution, accuracy and dynamic performance as follows:

Model SDC1702XYZ is a 10-bit converter which has an overall accuracy of ± 22 arc-minutes and a resolution of 21 arc-minutes.

Model SDC1700XYZ is a 12-bit converter with an overall accuracy of ± 8.5 arc-minutes and a resolution of 5.3 arc-minutes.

Model SDC1704XYZ is a 14-bit converter with an overall accuracy of ± 2.2 arc-minutes ± 1 LSB and a resolution of 1.3 arc-minutes.

The XYZ code defines the option thus: (X) signifies the operating temperature range, (Y) signifies the reference frequency, (Z) signifies the input voltage and range, and whether it will accept synchro or resolver format.

More information about the option code is given under the heading of "Ordering Information".

NOTE

For all the standard options, no external transformers are needed with these converters.

SPECIFICATIONS (typical @ +25°C unless otherwise noted)

| MODELS | SDC1702 | SDC1700 | SDC1704 |
|--|---|--|-----------------------------------|
| ACCURACY ¹ (max error) | | | |
| 60Hz | ±22 arc-minutes | ±8.5 arc-minutes | ±2.9 arc-minutes ±1LSB |
| 400Hz | ±22 arc-minutes | ±8.5 arc-minutes | ±2.2 arc-minutes ±1LSB |
| 2.6kHz | ±22 arc-minutes | ±8.5 arc-minutes | ±2.9 arc-minutes ±1LSB |
| RESOLUTION | 10 Bits (1LSB = 21 arc-mins) | 17 Bits (1LSB = 5.3 arc-mins) | 14 Bits (1LSB = 1.3 arc-mins) |
| OUTPUT (In Parallel) | 10 Bits (Natural Binary) | 12 Bits (Natural Binary) | 14 Bits (Natural Binary) |
| SIGNAL AND REFERENCE FREQUENCY | 60Hz, 400Hz, 2.6kHz | * | * |
| SIGNAL VOLTAGE (Line-to-Line) | | | |
| Low Level | 11.8V rms | * | * |
| High Level | 90V rms | * | * |
| SIGNAL IMPEDANCES | | | |
| Low Level | 26kΩ (Resistive) | * | * |
| High Level | 200kΩ (Resistive) | * | * |
| REFERENCE VOLTAGE | | | |
| Low Level | 26V (11.8V Signal) | * | * |
| High Level | 115V (90V Signal) | * | * |
| REFERENCE IMPEDANCE | 270kΩ (115V Signal) 56kΩ (26V Reference) (Impedance is Resistive) | * | * |
| TRANSFORMER ISOLATION | 500V dc | * | * |
| TRACKING RATE (min) | | | |
| 60Hz | 5 Revolutions Per Second | * | 500°/sec |
| 400Hz | 36 Revolutions Per Second | * | 12 Revolutions Per Second |
| 2.6kHz | 75 Revolutions Per Second | * | 25 Revolutions Per Second |
| Accel. ¹ | | | |
| Constant K _a | | | |
| 60Hz | 1880/sec ² | * | 520/sec ² |
| 400Hz | 110,000/sec ² | * | 36,000/sec ² |
| 2.6kHz | 518,000/sec ² | * | 170,000/sec ² |
| STEP RESPONSE (179° Step) (For 1LSB Error) | | | |
| 60Hz | 1.5sec | * | * |
| 400Hz | 125ms | * | * |
| 2.6kHz | 50ms | * | * |
| POWER LINES | ±15V @ 25mA } ±5% +5V @ 70mA } | * | ±15V @ 30mA } ±5% +5V @ 85mA } |
| POWER DISSIPATION | 1.1 Watts | * | 1.3 Watts |
| DATA LOGIC OUTPUT ² (TTL Compatible) | 2TTL Loads SDC17026YZ 4TTL Loads SDC17025YZ | 2TTL Loads SDC17006YZ 4TTL Loads SDC17005YZ | 2TTL Loads on All Options |
| BUSY LOGIC OUTPUT, POSITIVE PULSE (1 TTL Load) | | | |
| 60Hz | 9.0μs | * | 9.0μs |
| 400Hz | 2.0μs | * | 2.0μs |
| 2.6kHz | 2.0μs | * | 1.3μs |
| MAX DATA TRANSFER TIME | | | |
| 60Hz | 40μs | * | 35μs |
| 400Hz | 5.0μs | * | 3.0μs |
| 2.6kHz | 1.8μs | * | 0.8μs |
| INHIBIT INPUT (To Inhibit) | Logic "0" 1 TTL Load | * | Logic "0" 2 TTL Loads |
| WARM UP TIME | 1 sec to Rated Accuracy | * | * |
| TEMPERATURE RANGE | | | |
| Operating | 0 to +70°C Standard -55°C to +105°C Extended | * | * |
| Storage | -55°C to +125°C | * | * |
| DIMENSIONS | 3.125" x 2.625" x 0.4" (79.4 x 66.7 x 10.2mm) | * | * |
| WEIGHT | 3 ozs. (85 grams) | * | * |

NOTES

*Specifications same as SDC1702.

¹Specified over the appropriate operating temperature range of the option and for:
(a) ±10% signal and reference amplitude variation (b) 10% signal and reference
Harmonic Distortion (c) ±5% power supply variation (d) ±10% variation in reference
frequency.

²It is recommended that buffers should be used if the above converters
are required to drive over a distance greater than 6".

Specifications subject to change without notice.

VOL. II, 13-50 SYNCHRO & RESOLVER CONVERTERS

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