MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ABB

AI835A 3BSE051306R1

THERMOCOUPLE ANALOG INPUT MODULE

Used with the applicable S800 I/O configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

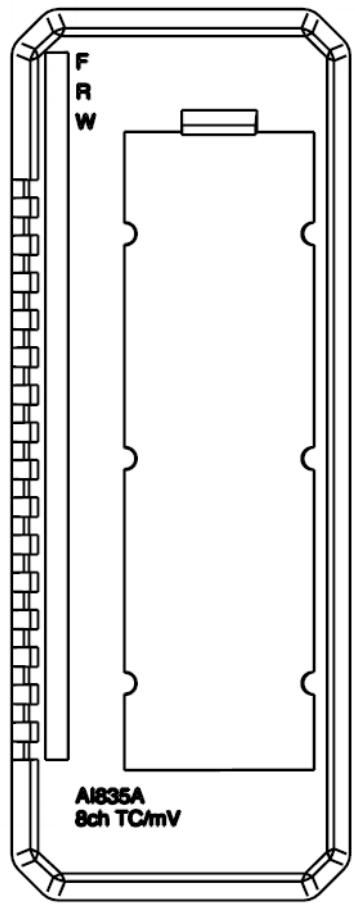
Selected official manufacturer pages follow this cover.

Source: ABB S800 I/O Modules and Termination Units 3BSE020924-600 A; model-specific specification sections.

AI835/AI835A Thermocouple/mV Input Module

Features

- 8 differential input channels for thermocouple/mV.
- Channel 8 can be designated as the CJ-channel (4-wire Pt100 RTD).
- Variety of thermocouples with the following characteristics: B, C, E, J, K, N, R, S and T for AI835A also D, L and U.
- 15 Bit resolution (A/D).
- Inputs are monitored for wire-break open-circuit.



Description

The AI835/AI835A Thermocouple/mV Input Module is part of the S800 I/O. It provides 8 differential input channels for Thermocouple/mV measurements. Measurement ranges configurable per channel are:
-30 mV to +75 mV linear, or TC Types B, C, E, J, K, N, R, S and T, for AI835A also D, L and U.

One of the channels (Channel 8) may be configured for “Cold Junction” (ambient) temperature measurements, thus serving as CJ-channel for Ch. 1...7. The junction temperature may be measured locally on the MTUs screw terminals, or on a connection unit distant form the device. Alternatively, a fix junction temperature for the module may be set by the user (as parameter) or for AI835A also from the application. Channel 8 may be used in the same manner as Ch. 1...7 when no CJ-temperature measurement is needed.

Each input-channel can measure a mV type of signal source (Thermocouple or linear), and may be grounded or ungrounded.

Full self-calibration is obtained by means of 0V, 50 mV and 100 ohm references, which are regularly updated.

Six different types of MTUs can be used. The TU830 (or TU833) Extended MTU or the TU810 (or TU814) Compact MTU enables three wire connection to the devices without additional terminals. The TU812 Compact MTU has a D-Sub 25 pin (male) connector for connection to the process. TU818 Compact MTU provides connection to 2-wire transmitters without external marshaling.

Shielded field cables are required for process connections.

Technical Data

Table 23. AI835/AI835A Thermocouple/mV Input Module Specifications at 25°C

Feature	AI835/AI835A Thermocouple/mV Input Module
Number of channels	8 (Differential)
Type of input	-30 mV to 75 mV linear, or TC types B, C, E, J, K, N, R, S and T. AI835A also D, L and U.
Measurement range	See Table 24
Input impedance	> 1 MΩ
CJ-temperature measurement reference	4-wire connected IEC-751/Pt100 RTD, TY820 can be used
Maximum field cable length	600 meters (656 yd.)
CMV between channels, max.	12 V d.c.
CMRR, 50 Hz, 60 Hz	120 dB
NMRR, 50 Hz, 60 Hz	>60 dB(1)
Resolution (A/D)	15 bits

Table 23. AI835/AI835A Thermocouple/mV Input Module Specifications at 25°C (Continued)

Feature	AI835/AI835A Thermocouple/mV Input Module
Error	0.1%
Temperature drift	Typ. 5 ppm/°C Max. 7 ppm/°C (AI835A) Max. 30 ppm/°C (AI835)
Filter, analog (1st order Low-pass)	10 Hz
Filter (integration)	50 Hz or 60 Hz
Update cycle time, max.	280 ms + n x 80 ms at 50 Hz 250 ms + n x 70 ms at 60 Hz (n = active channels)
Supervision	Module: reference channels, power supply low Channel: open-circuit(2) CJ-channel(CH8): <-40°C (-40°F) and >100°C (212°F)
Current consumption 24 V (Modulebus)	50 mA
Current consumption 5 V (Modulebus)	75 mA
Power dissipation	1.6 W
Isolation	Groupwise isolated from ground
Module termination units	TU810, TU812, TU814, TU818, TU830 or TU833
MTU keying code	BA
Rated insulation voltage	50 V
Dielectric test voltage	500 V a.c.

(1) >40 dB at 50 Hz and 60 Hz ±1%
(2) Cycle time for open circuit supervision = (Update cycle time) * (number of active channels)

Table 24. AI835/AI835A Range/Linearization

Input Type	Temperature Range
TC type B (1)	44...1820°C, 111.2...3308°F
TC type C	0...2300°C, 32...4172°F
TC type D (2)	0…2300°C, 32...4172°F
TC type E (1)	-270...1000°C, -454...1832°F
TC type J (1)	-210...1200°C, -346...2192°F
TC type K (1)	-270...1372°C, -454...2501.6°F
TC type L (2)	-200…900 °C, -328…1652 °F
TC type N (1)	-270...1300°C, -454...2372°F
TC type R (1)	-50...1768°C, -58...3214.4°F
TC type S (1)	-50...1768°C, -58...3214.4°F
TC type T (1)	-270...400°C, -454...752°F
TC type U(2)	-200…600 °C, -328…1112 °F
Linear range	-30...75 mV
Pt100 RTD (for CJC) (3)	-40...100°C, -40...212°F

(1) Linearization per IEC 584-1 1995, and following ITS 90 requirements.
(2) Only for AI835A
(3) Sensor Type applies to Channel 8 only, for the measuring of the Cold Junction Compensation temperature.

From the 11 Sensor Types above, one choice is to be selected by the user **per channel**.

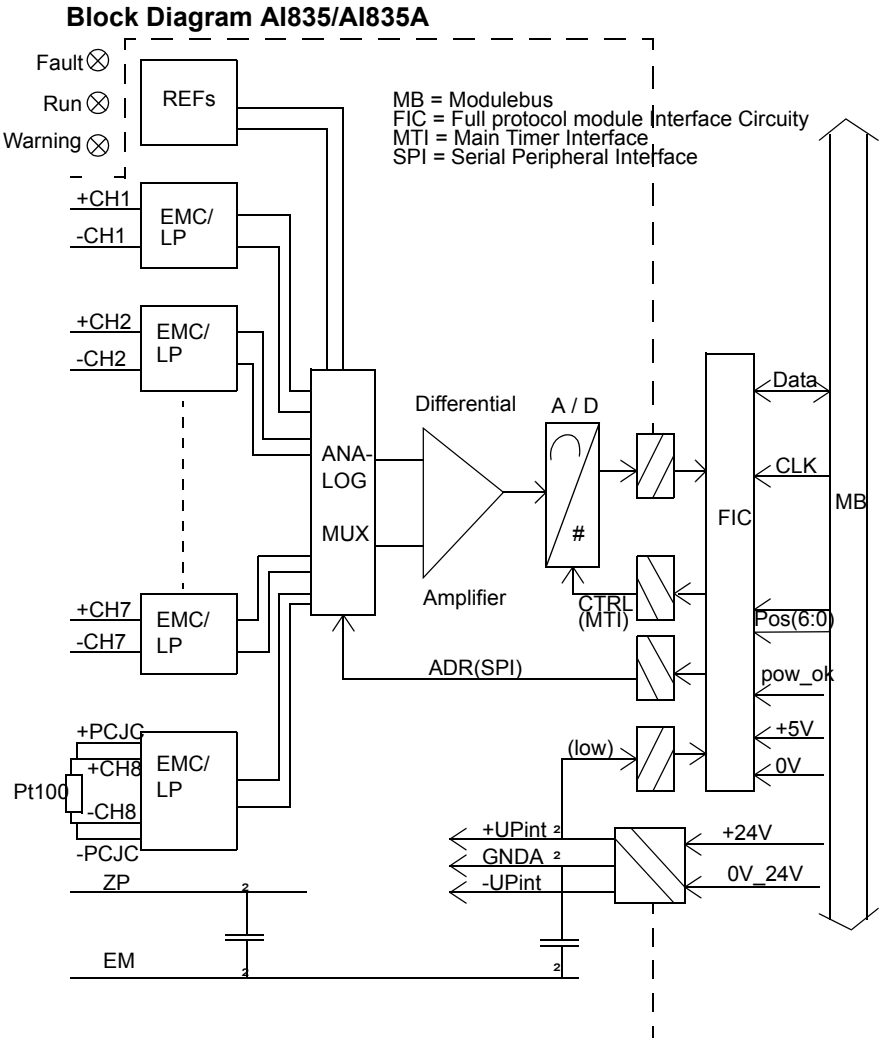


Figure 39. AI835/AI835A Block Diagram