12.5 AT352

12.5.1 Technical Data


Module ID	AT352
General Information	
Model Number	7AT352.70
Short Description	2003 Analog Input Module, 2 inputs, PT100 (3-line connection), -200 to +850 °C, screw-in module, Order TB712 terminal block separately!
C-UL-US Listed	in preparation
B&R ID Code	$1A
Slot	AF101 adapter module, CP interface
Static Characteristics	
Module Type	B&R 2003 screw-in module
Number of Inputs	2

Sensor
  Type
  Connection
  Standard
	PT100
	3-line connection
	IEC/EN 60751

Digital Converter Resolution	16 Bit
Measurement Range	2 ranges can be set
Small Measurement Range Resolution	-200.00 to +327,67 °C 0.01 °C
Large Measurement Range Resolution	-200.0 to +850.0 °C 0.1 °C
Measurement Update	20 or 16.67 ms
Maximum Temperature Measurement Error at 25 °C	$\pm(0.17 + 0.0005 * T_F)$ [°C] T_F ... Sensor Temperature in °C
Maximum Temperature Measurement Error because of drift per °C	$\pm(0.01 + 0.000031 * T_F)$ [°C] T_F ... Sensor Temperature in °C
Conversion of Measurement Values to Temperature Values	Automatic in the module
Measurement Current	2 mA
Power Consumption	Max. 0.4 W

Module ID	AT352
Operating Characteristics	

Electrical Isolation
    Input - PCC
    Input - Input
	No
	No

Mechanical Characteristics	
Dimensions	B&R 2003 screw-in module

12.5.2 Input Circuit Diagram

12.5.3 Connections

TB712
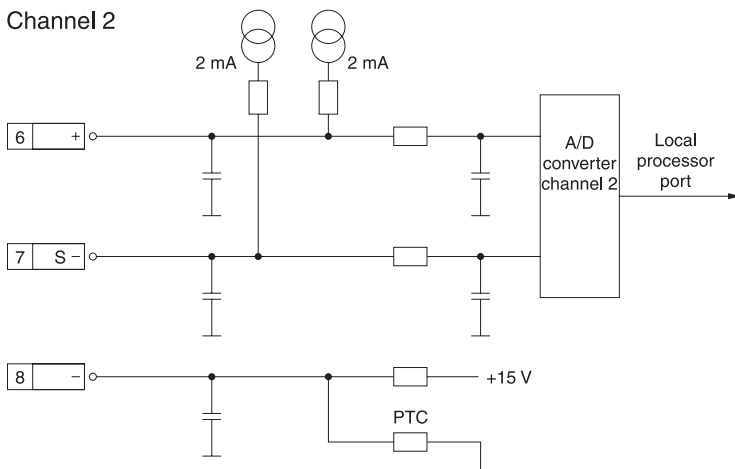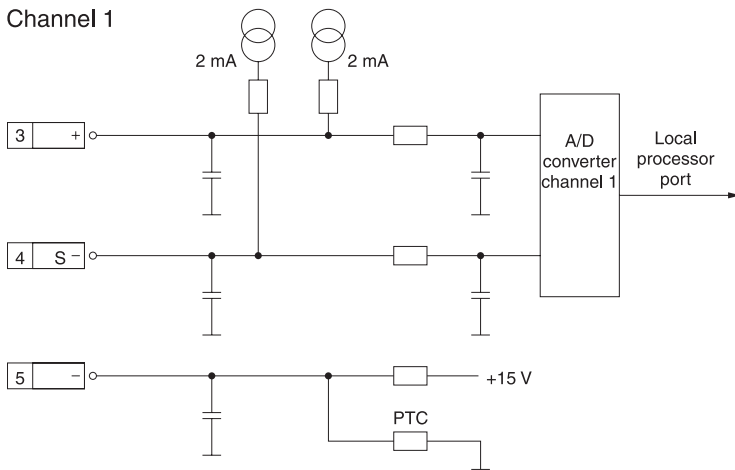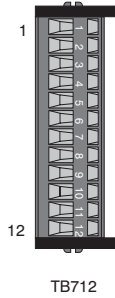
Pin	Assignment
1	+ Sensor 1
2	- Sense 1
3	- Sensor 1
4	Shield
5	+ Sensor 2
6	- Sense 2
7	- Sensor 2
8	Shield
9	- Sense 1
10	- Sense 2
11	n. c.
12	n. c.

12.5.4 Connection Examples

3-Line Connection

Diagram	Connection Example

2-Line Connection

Diagram	Connection Example
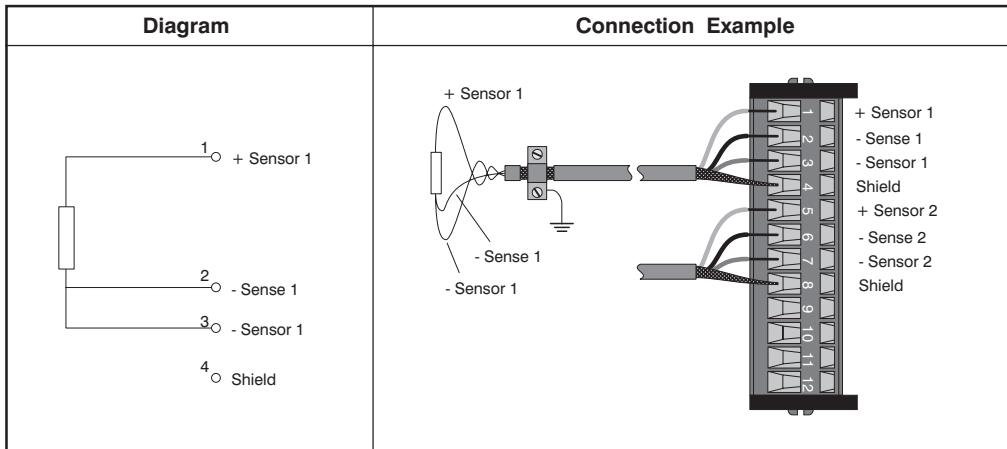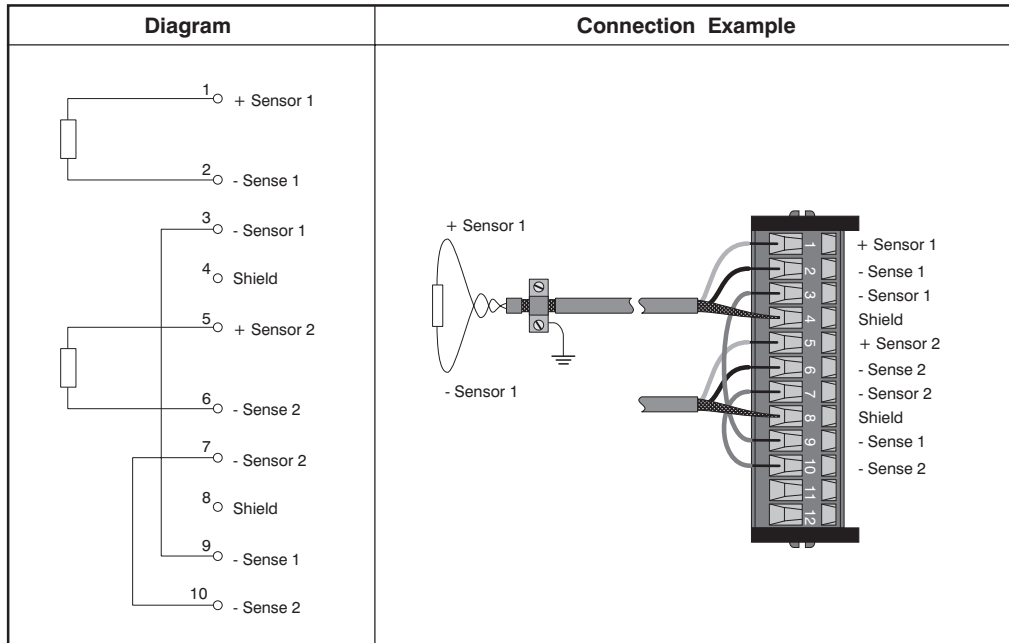
12.5.5 Variable Declaration

The variable declaration is valid for the following controllers:

- 2003 PCC CPU
- Remote I/O Bus Controller
- CAN Bus Controller

The variable declaration is made in PG2000. The variable declaration is described in Chapter 4, "Module Addressing".

Automation Studio™ Support: See Automation Studio™ Help starting with V 1.40

Accessing screw-in modules is also explained in the sections "AF101" and "CPU".

Data access takes place using data and configuration words. The following table provides an overview of which data and configuration words are used for this module.

Data Access	VD Data Type	VD Module Type	VD Chan.	R	W	Description
Data word 0	INT16	Analog In	1	●		Temperature channel 1
Data word 1	INT16	Analog In	2	●		Temperature channel 2
Configuration word 12	WORD	Transp. In	24	●		Module status
Configuration word 14	WORD	Transp. In	28	●		Module type
	WORD	Transp. Out	28		●	Module configuration

12.5.6 Access Using CAN IDs

Access via CAN Identifiers is used if the slave is being controlled by a device from another manufacturer.
Access via CAN Identifiers is described in an example in Chapter 4, "Module Addressing".
The transfer modes are explained in Chapter 5, "CAN Bus Controller Functions".

Data cannot be packed on the AT352. Therefore one CAN object is transferred per screw-in module.
If an adapter module AF101 is equipped with a four AT352 modules, the CAN object has the following structure:

Slot	CAN ID [1]	Word 1		Word 2		Word 3	Word 4
1	542	Chan. 1L	Chan. 1H	Chan. 2L	Chan. 2H	Not used (4 byte objects)	
2	543	Chan. 1L	Chan. 1H	Chan. 2L	Chan. 2H	Not used (4 byte objects)	
3	544	Chan. 1L	Chan. 1H	Chan. 2L	Chan. 2H	Not used (4 byte objects)	
4	545	Chan. 1L	Chan. 1H	Chan. 2L	Chan. 2H	Not used (4 byte objects)	

[1] CAN ID = 542 + (nd - 1) x 16 + (ma - 1) x 4 + (sl - 1)

nd ..... Node number of the CAN slave = 1

ma .... Module address of the AF101 = 1

sl .... Slot number of the screw-in module on the AF101 (1 - 4)

> ⚠ **B&R 2000 users have to exchange the data so that the high data is first (Motorola format)!**

For more information on ID allocation, see Chapter 5, "CAN Bus Controller Functions".

12.5.7 Description of Data and Configuration Words

Data Words 0 and 1 (read)

Reads the temperature using the set resolution.

Chan.	Resolution	Configuration word 14	Value range
1	0.1 °C	$0x00	-200.0 °C to +850.0 °C corresponds to -2000 to +8500
	0.01 °C	$0x01	-200.00 °C to +327.67 °C corresponds to -20000 to +32767
2	0.1 °C	$0x00	-200.0 °C to +850.0 °C corresponds to -2000 to +8500
	0.01 °C	$0x02	-200.00 °C to +327.67 °C corresponds to -20000 to +32767

Configuration Word 12 (read)

Configuration word 12 contains the module status.

	Bit	Description
	12 - 15	x .... Not defined, masked out
	11	0 .... Converter value 1 ready 1 .... Converter value 1 not yet ready
	10	0 .... Converter value 2 ready 1 .... Converter value 2 not yet ready
	2 - 9	x .... Not defined, masked out
	1	0 .... Resolution of channel 2 is 0.1 °C 1 .... Resolution of channel 2 is 0.01 °C
	0	0 .... Resolution of channel 1 is 0.1 °C 1 .... Resolution of channel 1 is 0.01 °C

x	x	x	x			x	x	x	x	x	x	x	x		

15   8   7   0

Configuration Word 14 (read)

The High Byte of configuration word 14 defines the module code.

	Bit	Description
	8 - 15	Module code = $1A
	0 - 7	x .... Not defined, masked out

0	0	0	1	1	0	1	0	x	x	x	x	x	x	x	x

15   8   7   0

Configuration Word 14 (write)

The module is configured using configuration word 14.

	Bit	Description
	13 - 15	0
	12	Selection of the hardware filter time for channel 1 and channel 2 0 .... 50 Hz (default) 1 .... 60 Hz
	2 - 11	0
	1	Resolution of channel 2 0 .... 0.1 °C (default) 1 .... 0.01 °C
	0	Resolution of channel 1 0 .... 0.1 °C (default) 1 .... 0.01 °C

0	0	0		0	0	0	0	0	0	0	0	0	0		

15   8   7   0