

User Manual

7085A Temperature Distribution and 10 Channel Scanner Module

Version 1.1 March 2021

Time Electronics Ltd

Unit 5, TON Business Park, 2-8 Morley Road, Tonbridge, Kent, TN9 1RA, United Kingdom.

T: +44 (0) 1732 355993 | F: +44 (0) 1732 350198 mail@timeelectronics.co.uk | www.timeelectronics.com © 2021 Time Electronics Ltd.

All rights reserved.

Nothing from this manual may be multiplied, or made public in any form or manner, either electronically or hard copy, without prior written consent from Time Electronics Ltd. This also applies to any schematics, drawings and diagrams contained herein.

This manual provides operating and safety instructions for the Time Electronics product. To ensure correct operation and safety, please follow the instructions in this manual.

Time Electronics reserves the right to change the contents, specifications and other information contained in this manual without notice.

Contents

1	Intro	oduction	4
	1.1	General Description	4
	1.2	Specifications	5
2	Оре	ration	6
	2.1	Operational Guidelines	6
	2.2	Using Time Electronics Dry Block Calibrators	6
	2.3	Thermocouple and RTD Connection	7
	2.4	Cold Junction Compensation (CJC)	8
	2.5	Connection to 7051 or 8060 Modules	9
	2.6	Using EasyCal Software with the 7085A	.10
3	Add	ditional Applications	17
	3.1	Temperature Transmitters	. 17
	3.2	Thermocouple Simulation (7051 Module only)	. 18
	3.3	Custom Applications Using the 7085A	.19
4	War	ranty and Servicing	20

1 Introduction



1.1 General Description

The 7085A is a temperature distribution module that allows users to quickly create multichannel measurement applications. It is designed to switch 8 thermocouple inputs and 1 RTD reference to a common output. The module interfaces with EasyCal software and the 10 channel scanner in the multimeter section of the 7051+, 8060+, or 5065B modules.

The 7085A supports multifunction measurements including resistance, AC/DC voltage and current, thermocouple and RTD. For temperature measurements the cold junction compensation is equipped to improve accuracy and is shown via an LCD display on the module, and factored by EasyCal software via internal communication during applications.

The module provides a convenient method of temperature UUT connection and calibration. To automate the process, EasyCal software controls the dry block calibrator (see TE range) and captures readback via the CalBench control centre (with integral multimeter) for automated testing. This method means that a typically time consuming temperature calibration application can be performed without relying on the user to manually step through the temperature ranges. The multiple input connections aid the workload further by allowing up to 8 thermocouples to be tested at one time. The 7085A is an excellent solution that saves both time and resources by automation and batch testing capabilities.

1.2 Specifications

Requirements	The 7085A interfaces with 7051, 8060, 8051 and 5065B modules. For automation EasyCal software is required on a control centre module or separate PC.
Thermocouple Input Connections	8 x inputs, connections via standard & miniature TC type, or 4 mm shrouded sockets
Reference RTD Input Connection	1 x RTD input, connections via 3 wire RTD type, bare wire screw terminals, or 4 pin multiway connector
Reference Thermocouple	A reference thermocouple can be used by connecting to input #8 on the module
Internal Connections	Integral to the CalBench console for communication with compatible modules
Maximum AC Voltage	125 V rms or 175 V peak, 100 kHz, 1 A switched, 62.5 VA (resistive load)
Maximum DC Voltage	110 V, 1 A switched, 30 VA (resistive load)
Actuation Time	5 ms maximum on/off
Contact Potential	< ± 500 nV typical per contact, 1 μ V max / < ± 500 nV typical per contact pair, 1 μ V max
Isolation between any two terminals	> 10 Gohm, < 75 pF
EasyCal Compatible Dry Block Calibrators	For full automation a TE dry block calibrator can be driven by EasyCal software. Models supported include: 8070, 8071, 8072, 7860, 7862, 7870, 7872, 7880, 7882. See separate data sheets for information and specifications
Module Width	250 mm (primary or secondary console fitting)

2 Operation

2.1 Operational Guidelines

The 7085A is designed to be used with the 7051 module or the 8060 Module that features the AVM65 option (standard with 8060+ version). Note the 7085A interfaces with the integral multimeter section of both modules.

The purpose of the 7085A is to enable users to automate temperature calibration applications. For full usability a compatible Time Electronics Dry Block Calibrator and EasyCal Software must be used.

Note: The 7085A cannot be used with the standard measure function of the 8060. It must be connected and operated via the AVM65 measure section and EasyCal software.

2.2 Using Time Electronics Dry Block Calibrators

The Time Electronics range of dry block calibrators can be driven by EasyCal software to automate testing procedures. Standard models feature a USB port that can be connected to the CalBench control centre via the under section of the primary console. Some legacy model dry block calibrators feature RS-232 communication, this is also connected under the console.

When a CalBench is ordered with a compatible dry block calibrator and module with EasyCal, the software drivers are included as standard.



7085A Temperature Distribution and 10 Channel Scanner Module

2.3 Thermocouple and RTD Connection

Inputs to the 7085A are via 4mm terminals, thermocouple connectors, RTD probe connector, 3 wire RTD Connector or 4 wire terminal block.

Thermocouple channels 1 to 8 are shared with the 4mm terminals 1 to 8. The RTD input channels are shared with channels 9 and 10. 4 wire input connection is only available on channels 9 & 10 and the RTD terminal block.

The 7085A can be used with a reference probe (see Time Electronics TERS range).



7085A Temperature Distribution and 10 Channel Scanner Module

2.4 Cold Junction Compensation (CJC)

The 7085A has a temperature display on the module. EasyCal software automatically reads the CJC from the 7085A in the testing application.



When using a **<u>7051 module</u>** the 7085A can be manually configured for operation. A simple user interface displays the CJC reading from the 7085A module.

)04	4.7	°C	NULL HOLD Scanner Channel
— түре - <mark>К</mark>	— —units ▼ <mark>°C</mark>		DIGITS	6.5	1 CJC 24.6°C 7085
DCV	ACV	Ω2W	FREQ	PT100	
DCI	ACI	Ω4W	PER	T/C	
					Exit

2.5 Connection to 7051 or 8060 Modules

2.5.1 7051 Module



2.5.2 8060 Module (requires AVM65 option to be fitted)



2.6 Using EasyCal Software with the 7085A

2.6.1 Principal of operation

The dry block calibrator is automatically set to test points created, allowing time for the temperature to stabilise. The 7085A automatically switches between probes under test, plus reference probe if used, and the readings captured by the 7051 / 8060 AVM DMM modes.

2.6.2 Creating a Procedure

When creating a new procedure, select the 'Thermocouple Sensor' device type. This preconfigures the column headers with default settings and enables the procedure wizard feature.

C Procedures C Edit Procedure Details TC-SENSOR	
Procedure Details Procedure Details Procedure Data DiscreteNSOR Type: Thermocouple Sensor Manufacturer: Thermosense Description: Thermocouple Sensor Certificate Column Titles and Types Test Name Required (Set) Value	Select Version: 0 • mei
Minimum Test Set Point Test Test Minimum Allowed Error / Tolerance Result / Found Error Type: Absolute Values Type: Title: UULT Title: Specification Title: Error % of	UUT Reading Ut Status ype: Pass/Fail
Comments Approval Options Document Links Statements Default Certificate Comments - Cover Page / Header Comments	OK Cancel
Number of Procedures Found: 5	v2.31.45

Using the procedure wizard a sequence of tests is created using the parameters entered.

C TC-SENSOR Test Details		
Add I transf		lose
No. Function: C Calibrating Inst: 7070 Jofra 140 Dry Block	•	d Value
Range: 25 to 100 *C ▼ Setting Resolution: 0.1 ▼ Setting Band ± 0.5 *C ▼ Wait For Stable: Use Jo	fra 💌	
Output Function: THERMOCOUPLES Calibrating Inst: 7051 DMM (Measure) Range: 25 to 100 *C Calibrator Options Resolution: 0.001 Calibrator Options CJC 7085 Type: Type: VUse Scanner Value Scanner Value Scanner Value Scanner	•	
Details Allowed / Reject Error 2 °C Fror 2 °C Calculated Error Number of Test Points: 5 Number of Devices Under Test: 5	Create Create Cancel	
Test In Memory: <none></none>		」 , //.

2.6.2.1 Input

The input parameters apply to the dry calibrator and external reference probe is if used. The input range is set to the minimum and maximum test points required.

Test Wizard for: Thermocouple Sensor	
Function: °C	Calibrating Inst: 7070 Jofra 140 Dry Block
Range: 25 to 100 °C 💌	
Setting Resolution: 0.1	
Setting Band ± 0.5 °C 💌	Wait For Stable: Use Jofra

Note: When entering the input range, the values are duplicated to the output range to aid the user.

Calibration Instrument - Dry Block Calibrator Only

In this case the master reading is taken from the dry block's internal reference. Select the dry block from the *Input* calibrating instrument list.

Calibration Instrument - Dry Block Calibrator + Reference Probe

In this case an external reference probe is used as the master reading. The 7051 DMM/ 8060 AVM is used to measure the reading from the reference probe. Select the DMM + Dry Block from the *Input* calibrating instrument list.

If the reference probe is a thermocouple the type and CJC reference options are made available. Channel 1 is used for the thermocouple reference probe.

Wait For Stable

To achieve a high precision of measurement it is necessary to allow the dry block to stabilise. EasyCal can be setup to wait until the temperature is stable before taking any further measurements.

To use the dry block's internal temperature stability feature (recommended) select 'Use Jofra'. This method takes between three and five minutes for stabilisation.

Alternatively EasyCal can monitor the readings and allow the tests to proceed after a number of tests are with a set percentage of each other. The default settings for this type of stabilisation are 10 readings within 1 percent of each other. These parameters can be modified in each test if required.

Setting Band

To ensure the test point is near the mean value required, a setting band for the input temperature is set. A test will not proceed unless the value is within the setting band.

2.6.2.2 Output

This is the unit under test. The output range is usually the equal to the input range. The Calibrating Instrument is the DMM used to measure the output of the thermocouple or other type of temperature sensor.

	Function:	THERMOCOUPLES	-	Calibrating Inst: 7051 DMM (Measure)	•
Range:	25	to 100 °C	•	Calibrator Options	
		Resolution: 0.001	•	СЈС 7085 🔽 Туре: Туре К	
				Vse Scanner	

CJC & Thermocouple Type

For thermocouple sensors the CJC reference and thermocouple type options are available. In most cases the CJC reference is set to 7085.

Use Scanner

Tick this option to utilise the automatic switching capabilities of the 7085A

2.6.2.3 Details

Allowed / Reject	Adjust To Error	Method: Up	Create
Calculated Error		Number of Test Points: 5	
		Number of Devices Under Test: 6	٢
			Cancel

Number of devices under test

This determines the number of channels which will be used. A maximum of 8 thermocouples can be calibrated using the 7085A.

Number of test points

The range is divided by the number of test points.

Method

For temperature sensors this is usually up. The procedure wizard will create test points from 0 to 100% of the range entered.

2.6.2.4 Test Details

From the wizard a sequence of tests is created. Normally this is all that is necessary, but each test can be individually edited if required.

😥 TC-S	ENSOR Test Details					
Add	Insert Edit Copy	Paste Undo Print	→ 👸 🔯 🦨 Jelete Vizard Uncerts Sin	nulate Views Close		
No.	Test Name	Test Type	Test Function	Required Value	Input M	Allo
1	Reference Reading	7051 DMM (Measure)	[°C] PT100	[25.000°C] 25.000°C	DMM M	
2	(No:1) 0%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[25.000°C] 25.0°C	DMM M	2°C
3	(No:2) 0%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[25.000°C] 25.0°C	DMM M	2°C
4	(No:3) 0%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[25.000°C] 25.0°C	DMM M	2°C
5	(No:4) 0%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[25.000°C] 25.0°C	DMM M	2°C
6	(No:5) 0%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[25.000°C] 25.0°C	DMM M	2°C
7	Reference Reading	7051 DMM (Measure)	[°C] PT100	[50.000°C] 50.000°C	DMM M	
8	(No:1) 25%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[50.000°C] 50.0°C	DMM M	2°C
9	(No:2) 25%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[50.000°C] 50.0°C	DMM M	2°C
10	(No:3) 25%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[50.000°C] 50.0°C	DMM M	2°C
11	(No:4) 25%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[50.000°C] 50.0°C	DMM M	2°C
12	(No:5) 25%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[50.000°C] 50.0°C	DMM M	2°C
13	Reference Reading	7051 DMM (Measure)	[°C] PT100	[75.000°C] 75.000°C	DMM M	
14	(No:1) 50%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[75.000°C] 75.0°C	DMM M	2°C
15	(No:2) 50%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[75.000°C] 75.0°C	DMM M	2°C
16	(No:3) 50%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[75.000°C] 75.0°C	DMM M	2°C
17	(No:4) 50%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[75.000°C] 75.0°C	DMM M	2°C
18	(No:5) 50%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[75.000°C] 75.0°C	DMM M	2°C
19	Reference Reading	7051 DMM (Measure)	[°C] PT100	[100.000°C] 100.000°C	DMM M	
20	(No:1) 75%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[100.000°C] 100.0°C	DMM M	2°C
21	(No:2) 75%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[100.000°C] 100.0°C	DMM M	2°C
22	(No:3) 75%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[100.000°C] 100.0°C	DMM M	2°C
23	(No:4) 75%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[100.000°C] 100.0°C	DMM M	2°C
24	(No:5) 75%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[100.000°C] 100.0°C	DMM M	2°C
25	Reference Reading	7051 DMM (Measure)	[°C] PT100	[125.000°C] 125.000°C	DMM M	
26	(No:1) 100%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[125.000°C] 125.0°C	DMM M	2°C
27	(No:2) 100%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[125.000°C] 125.0°C	DMM M	2°C
28	(No:3) 100%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[125.000°C] 125.0°C	DMM M	2°C
29	(No:4) 100%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[125.000°C] 125.0°C	DMM M	2°C
30	(No:5) 100%	7051 DMM (Measure)	[Temp (°C)] Thermocouple	[125.000°C] 125.0°C	DMM M	2°C
•						+
Test In Me	emory: <none></none>					11.

The example above shows a series of tests using a reference pt100 probe to calibrate 5 thermocouples from 25 to 125 $^{\circ}$ C.

The procedure is created using a 'Reference Reading' for each test point. Each UUT reading is then compared against the reference reading test using the auxiliary reading function. Within the auxiliary reading function the input method is set to use 'Result from previous test' and the test number option is selected. This is the test result to compare against.

🚞 Auxiliary Reading			83
Calibrating Instrument		Function	
N/A	-	Temp (°C)	
Input Method		Test Number	
Result from previous test	•	1: Reference Reading (25°C)	
Auxiliary Nominal Value		Setting Limits (+/-)	
= 💌 25 °C	▼ 3	▼ D.Ps 0.5 °C ▼	I
Adjust Required Value			Save
N/A	•		
			Cancel

Note: If any tests are deleted or added the 'result from previous test' will be out of sequence. In this case the test numbers must be amended manually.

2.6.3 Calibration Run (CalRun)

The first test sets the dry block to the required temperature. CalRun displays the readings from the internal dry block reference or external reference probe as the temperature reaches the set point. Once the temperature is stable and is within the setting band, the reference temperature is recorded.



The example above shows a reference test using an external probe. The value shown in the main reading display (25.080°C) is the value of the reference probe measured by the DMM.

Although it states 'U.U.T reading (°C)' the measurement is the reference probe. The setting band is ± 0.5 °C. The dry block temperature (25.120°C) is shown in the auxiliary reading display. Time to stability (5 minutes) is also shown in this section.

Note: When using an external reference probe the setting band for the dry block calibrator is set to ten times the value of the reference probe setting band. This allows the external reference probe to control the accuracy of the set point.

CalRun automatically steps through each of the sensors under test for the given test point recording the values.



In the example above thermocouple under test sensor reading (26.1°C) is shown in the main reading display. The limits are ± 2 °C. This is compared against the reference result of test 1 (25.080°C). The cold junction value (23.4°C) as measured by the 7085A is also displayed.

Once the tests are completed for the first test point CalRun will set the dry block to the next test point required and the sequence is repeated.

2.6.4 Example Calibration Certificate

LasyGar	lssu	ed By: Laboratory			
	Certific	ate Number: 58124	4		
U.U.T Information	Procedure	Information	Calibrati	ion Information	
D: TC-SENSOR	Procedure:	DEM_J_65_T_TCx4A_85	Calibratio	n Date : 02 August 20 [.]	12
Description: Thermcouple Batch	Input Range	:25.00 to 50.00°C	Due Date:	01 August 2013 (52wl	ks)
Nodel: RS Type K	Output Rang	ge:25.00 to 50.00°C	Temperati	ure: 23.0°C	
Serial Number: BATCH	Reject Error	>:±5.00°C	Relative H	lumidity: 50%	
ocation:					
Comments:					
Serial numbers for indivual items as follows: (No:1) 10021. (No:2) 10022. (No:3) 10023. (Calibrator Information	(No:4) 10024				
Description	Serial No.	Cert No.	Cal Date	Cal Due	
7070 Jofra 140 Dry Block	50-88964	D-0045667	02 Jul 2012	01 Jul 2013	
7051 DMM (Measure)	50-009548	D-88930042	03 Jul 2012	02 Jul 2013	
7051 DMM (Measure) PT100 Probe Results:	50-009548 1-5000	D-88930042 UK-00979	03 Jul 2012 25 Jan 2012	02 Jul 2013 23 Jan 2013	
7051 DMM (Measure) PT100 Probe Results: Test	50-009548 1-5000 Set	D-88930042 UK-00979 Device	03 Jul 2012 25 Jan 2012 Device	02 Jul 2013 23 Jan 2013 Error % of	Deco/Fail
7051 DMM (Measure) PT100 Probe Results: Test Point	50-009548 1-5000 Set Temperature	D-88930042 UK-00979 Device Reading	03 Jul 2012 25 Jan 2012 Device Specification	02 Jul 2013 23 Jan 2013 Error % of Specification	Pass/Fail
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C	D-88930042 UK-00979 Device Reading 25.17°C 25.13°C	03 Jul 2012 25 Jan 2012 Device Specification ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6%	Pass/Fail Pass Pass
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:2) 0%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.03°C	03 Jul 2012 25 Jan 2012 Device Specification ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4%	Pass/Fail Pass Pass Pass
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:4) 0%	50-009548 1-5000 Set Temperature 24.99 °C 24.99 °C 24.99 °C 24.99 °C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C	03 Jul 2012 25 Jan 2012 Device Specification ±5°C ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6%	Pass/Fail Pass Pass Pass Pass
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:2) 0% (No:3) 0% (No:4) 0%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C 31.36°C	03 Jul 2012 25 Jan 2012 Device Specification ±5°C ±5°C ±5°C ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2%	Pass/Fail Pass Pass Pass Pass Pass
7061 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:4) 0% (No:1) 25% (No:2) 25%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C 31.36°C 31.15°C	03 Jul 2012 25 Jan 2012 Device Specification ±5°C ±5°C ±5°C ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0%	Pass/Fail Pass Pass Pass Pass Pass Pass
7061 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:3) 0% (No:4) 25% (No:2) 25% (No:3) 25%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C 31.36°C 31.05°C	03 Jul 2012 25 Jan 2012 Device Specification ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0% -4.0%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:3) 0% (No:4) 25% (No:2) 25% (No:3) 25% (No:3) 25%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C 31.36°C 31.15°C 31.05°C 31.04°C	03 Jul 2012 25 Jan 2012 Device Specification ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0% -4.0% -4.0% -4.2%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:3) 0% (No:4) 0% (No:2) 25% (No:3) 25% (No:3) 25% (No:3) 25% (No:4) 25%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C 31.25°C 37.56°C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C 31.36°C 31.15°C 31.05°C 31.04°C 37.09°C	03 Jul 2012 25 Jan 2012 <u> Device</u> <u> Specification</u> <u> ±5°C</u> <u> ±5°C</u>	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0% -4.0% -4.0% -4.2% -9.4%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:3) 0% (No:4) 0% (No:4) 25% (No:2) 25% (No:3) 25% (No:3) 25% (No:4) 25% (No:4) 25% (No:4) 25% (No:4) 25%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C 37.56°C 37.56°C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C 31.36°C 31.15°C 31.05°C 31.05°C 31.04°C 37.09°C 36.97°C	03 Jul 2012 25 Jan 2012 <u>Specification</u> ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0% -4.0% -4.0% -4.2% -9.4% -11.8%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:3) 0% (No:3) 0% (No:3) 25% (No:3) 25% (No:4) 25% (No:4) 25% (No:4) 25% (No:4) 25% (No:3) 50%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.55°C 31	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C 31.36°C 31.16°C 31.06°C 31.06°C 31.04°C 31.04°C 33.09°C 36.97°C 37.05°C	03 Jul 2012 25 Jan 2012 <u>Specification</u> ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0% -2.0% -4.0% -4.2% -4.2% -11.8% -11.8% -10.2%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:4) 0% (No:1) 25% (No:4) 25% (No:2) 25% (No:3) 25% (No:4) 50% (No:2) 50% (No:2) 50% (No:3) 50% (No:3) 50%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C 31.25°C 37.56°C 37.56°C 37.56°C 37.56°C	D-88930042 UK-00979 Device Reading 25.17°C 25.01°C 25.01°C 25.02°C 31.38°C 31.36°C 31.05°C 31.05°C 31.04°C 35.09°C 36.97°C 37.05°C 37.05°C	03 Jul 2012 25 Jan 2012 <u>Specification</u> <u><u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C <u>f5</u>°C</u>	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.8% 0.4% 0.6% 2.2% -2.0% -4.0% -4.0% -4.2% -9.4% -11.8% -10.2% -10.2%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:3) 0% (No:4) 0% (No:1) 25% (No:2) 25% (No:2) 25% (No:3) 25% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 50%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C 31.25°C 37.56°C	D-88930042 UK-00979 Device Reading 25.17°C 25.01°C 25.02°C 31.36°C 31.36°C 31.05°C 31.04°C 31.04°C 37.09°C 36.97°C 37.05°C 42.24°C	03 Jul 2012 25 Jan 2012 <u>Specification</u> ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0% -4.0% -4.2% -9.4% -11.8% -10.2% -10.2% -23.0%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:2) 0% (No:3) 0% (No:1) 25% (No:2) 25% (No:2) 25% (No:3) 25% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 50%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.01°C 25.02°C 31.38°C 31.15°C 31.05°C 31.04°C 37.08°C 37.08°C 37.08°C 37.05°C 37.05°C 42.24°C 42.40°C	03 Jul 2012 25 Jan 2012 Device Specification ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 0.4% 0.6% 4.2% -2.2% -2.0% -4.0% -4.2% -9.4% -11.8% -10.2% -23.0% -23.0% -19.8%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:2) 0% (No:2) 0% (No:1) 25% (No:1) 25% (No:1) 25% (No:2) 25% (No:3) 25% (No:3) 25% (No:3) 50% (No:3) 50% (No:4) 50% (No:4) 50% (No:4) 50%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C 31.25°C 37.56°C 37.56°C 37.56°C 37.56°C 37.56°C 37.56°C 43.39°C 43.39°C 43.39°C	D-88930042 UK-00979 Device Reading 25.17°C 25.12°C 25.02°C 31.38°C 31.15°C 31.05°C 31.05°C 31.04°C 31.05°C 31.04°C 37.05°C 37.05°C 37.05°C 37.05°C 37.05°C 37.05°C	03 Jul 2012 25 Jan 2012 <u>Specification</u> ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 4.0% -4.2% -2.0% -4.0% -4.2% -9.4% -11.8% -10.2% -23.0% -19.8% -13.6%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:2) 0% (No:3) 0% (No:4) 0% (No:1) 25% (No:1) 25% (No:2) 25% (No:3) 25% (No:3) 25% (No:3) 50% (No:4) 50%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C 37.56°C 37.50°C 37.50°C 37.50°C 37.50°C 37	D-88930042 UK-00979 Device Reading 25.17°C 25.01°C 25.01°C 25.02°C 31.36°C 31.16°C 31.05°C 31.05°C 31.04°C 37.05°C 36.97°C 37.05°C 37.05°C 37.05°C 37.05°C 42.24°C 42.40°C 42.71°C 42.95°C	03 Jul 2012 25 Jan 2012 Specification ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 4.0% -4.2% -2.0% -4.0% -4.2% -9.4% -11.8% -10.2% -10.2% -10.2% -13.6% -23.0% -13.6% -8.8% -3.6%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:2) 0% (No:3) 0% (No:4) 0% (No:2) 5% (No:2) 25% (No:3) 25% (No:2) 25% (No:3) 25% (No:3) 25% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 75% (No:1) 75% (No:3) 75% (No:3) 75% (No:4) 76%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C 37.56°C 37.50°C 37.50°C 37.50°C 37.50°C 37.50°C 37.50°C 37.50°C 37.50°C 37	D-88930042 UK-00979 25.17°C 25.12°C 25.02°C 31.36°C 31.15°C 31.05°C 31.05°C 31.05°C 31.05°C 31.05°C 31.05°C 31.05°C 31.05°C 32.05°C 32.05°C 32.05°C 42.24°C 42.24°C 42.95°C 49.18°C	03 Jul 2012 25 Jan 2012 Specification ±5°C	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0% -4.0% -4.2% -9.4% -11.8% -10.2% -10.2% -10.2% -13.6% -8.8% -13.6% -8.8% -13.6%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas
7051 DMM (Measure) PT100 Probe Results: Test Point (No:1) 0% (No:2) 0% (No:3) 0% (No:4) 0% (No:4) 0% (No:1) 25% (No:2) 25% (No:2) 25% (No:2) 25% (No:3) 50% (No:1) 50% (No:2) 50% (No:3) 50% (No:3) 50% (No:3) 50% (No:3) 75% (No:3) 75% (No:3) 75% (No:3) 75% (No:3) 75% (No:3) 75%	50-009548 1-5000 Set Temperature 24.99°C 24.99°C 24.99°C 24.99°C 31.25°C 31.25°C 31.25°C 31.25°C 37.56°C 37.50°C 37.56°C 37.56°C 37.56°C 37.56°C 37.56°C 37.56°C 37.56°C 37.50°C 37	D-88930042 UK-00979 25.12°C 25.12°C 25.02°C 31.36°C 31.15°C 31.05°C 31.05°C 31.04°C 37.09°C 36.97°C 36.97°C 37.05°C 42.24°C 42.40°C 42.40°C 42.95°C 49.18°C	03 Jul 2012 25 Jan 2012 25 Jan 2012 25 Jan 2012 50 50 50 50 50 50 50 50 50 50	02 Jul 2013 23 Jan 2013 Error % of Specification 3.6% 2.6% 0.4% 0.6% 2.2% -2.0% -4.0% -4.2% -2.0% -4.0% -4.2% -10.2% -10.2% -10.2% -10.2% -13.6% -13.6% -8.8% -18.4% -20.6%	Pass/Fail Pass Pass Pass Pass Pass Pass Pass Pas

2.6.5 Traceability of an External Reference Probe

By default the external reference probe will not appear in the traceability section of the calibration certificate. Two methods are available to resolve this.

- a) Using the 'Edit Traceability' feature in PrintCert allows the standard to be added after a calibration is performed.
- b) Adding a non-printing test to the procedure which specifies the reference probe as a calibrating instrument.

In either case the reference probe(s) must be added, as a standard, to the calibrating instruments list in EasyEdit > System Setup > Calibrating Instruments.

For further information please consult the EasyCal user manual.

3 Additional Applications

3.1 Temperature Transmitters

The same principals, as described in the previous chapter, can be applied temperature transmitters with integral probes.



Unit Under Test (UUT)

3.2 Thermocouple Simulation (7051 Module only)

When using a 7051 to source simulated thermocouples the 7085A provides a suitable 4mm to thermocouple interconnection along with an improved cold junction reference.

Connections

Each 7085A thermocouple socket is connected in parallel with each red and black 4mm terminal. Connect the 7051 source main terminals to the 4mm sockets and, using a thermocouple compensating lead, connect the thermocouple socket to the UUT.





The 7085 is not required to perform any switching as there is a direct connection between the 7051 & 7085A.



7051 Source App

Select thermocouple from the 7051 source application.

From here select the 7085A as the CJ reference.

EasyCal

This selection is also used in EasyCal for any thermocouple source tests performed by the 7051. If a manual CJ reference is entered this value will also be used.

3.3 Custom Applications Using the 7085A

The 7085A is primarily utilised in temperature calibration on the CalBench. Because it is a 10 channel scanner the module can also be used for additional applications that require multi-channel measurements. For specific applications please consult Time Electronics for prior to purchase to ensure application coverage.

The diagram below shows a configuration for batch testing pressure transducers using an automatic pressure controller in conjunction with a 7085A.



4 Warranty and Servicing

Warranty

The Time Electronics products carry a one-year manufacturer's warranty as standard.

Time Electronics products are designed and manufactured to the highest standards and specifications to assure the quality and performance required by all sectors of industry. Time Electronics products are fully guaranteed against faulty materials and workmanship.

Should this product be found to be defective, please contact us using the below details. Inform us of the product type, serial number, and details of any fault and/or the service required. Please retain the supplier invoice as proof of purchase.

This warranty does not apply to defects resulting from action of the user such as misuse, operation outside of specification, improper maintenance or repair, or unauthorized modification. Time Electronics' total liability is limited to repair or replacement of the product. Note that if Time Electronics determine that the fault on a returned product has been caused by the user, we will contact the customer before proceeding with any repair.

Calibration and Repair Services

Time Electronics offers repair and calibration services for all the products we make and sell. Routine maintenance by the manufacturer ensures optimal performance and condition of the product. Periodic traceable or accredited calibration is available.

Contacting Time Electronics

Online:

Please visit **www.timeelectronics.com** and select Support Request from the Contact links. From this page you will be able to send information to the Time Electronics service team who will help and support you.

By phone: +44 (0) 1732 355993

By email: mail@timeelectronics.co.uk

Returning Instruments

Prior to returning your product please contact Time Electronics. We will issue a return merchandise authorization (RMA) number that is to accompany the goods returning. Further instructions will also be issued prior to shipment. When returning instruments, please ensure that they have been adequately packed, preferably in the original packing supplied. **Time Electronics Ltd will not accept responsibility for units returned damaged.** Please ensure that all units have details of the service required and all relevant paperwork.

Send the instrument, shipping charges paid to:

Time Electronics Ltd

Unit 5, TON Business Park, 2-8 Morley Road, Tonbridge, Kent, TN9 1RA. United Kingdom.

Tel: +44(0)1732 355993 Fax: +44(0)1732 350198

Email: mail@timeelectronics.co.uk Web Site: www.timeelectronics.com

Disposal of your old equipment



- 1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.
- 2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
- 3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
- 4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or return to Time Electronics.