



High Resolution Thermocouple/Millivolt Input Module

Cat. No. 1771-IXHRR

Documentation Update

Use This Addendum with:

The High Resolution Thermocouple/Millivolt Input Module (Cat. No. 1771-IXHR) User Manual, publication 1771-6.5.80, dated April 1991.

The 1771-IXHRR module is modified to work with two types of Russian thermocouples: **TXK / XK(L)** and **TBP / BP(A)-1**

The type **TXK** with characteristic **XK(L)** has a sensor with 90.5% nickel and 9.5% chromium in the positive lead and 56% copper and 44% nickel in the negative. It is used for temperatures from -200 degrees C to +600 degrees C (-328 degrees F to +1112 degrees F), and for short term temperatures up to +800 degrees C (+1472 degrees F). The 1771-IXHRR module covers the entire range.

The type **TBP** with characteristic **BP(A)-1** has a sensor with 95% tungsten and 5% rhenium in the positive lead and 80% tungsten and 20% rhenium in the negative. It is used for temperatures from 0 degrees C to +2200 degrees C, and for short term temperatures up to +2500 degrees C. The 1771-IXHRR module covers the range from 0 degrees C to +1800 degrees C (+32 degrees F to +3272 degrees F).

This manual addendum provides information on module features and configuration.

Module Description

The 1771-IXHRR module is identical to the 1771-IXHR module, differing only in firmware. Changes to the 1771-IXHR manual relative to the 1771-IXHRR are listed in this addendum.

The Module features, (chapter 2 of the 1771-IXHRR module manual), are adjusted to the needs of industry in the CIS. The configurable inputs can also be set to 8 different modes – 7 thermocouple modes and to 1 millivolt input mode.

The module accepts thermocouple types **B , E , J , K , S , TXK / XK(L)** and **TBP / BP(A)-1**.

When using the I/O Edit Function of the PLC-5 programming software, select **R** for the **TXK / XK(L)**. Choose **T** for the **TBP / BP(A)-1**. **R** and **T** are replaced in the firmware by **TXK / XK(L)** and **TBP / BP(A)-1** respectively.

Module features, installation , power requirements, module location and keying, connection and grounding are explained in the manual for the 1771-IXHR, chapter 3. Chapter 4 (programming) also applies without change.

The configuration of the module (chapter 5 of the 1771-IXHR manual) is changed by the replacement of the R thermocouple with the TXK/XK(L) and the T thermocouple with the TBP/BP(A)-1. A revised Table 5.A, below, reflects these changes. The table describes the 2 groups of 3-bit-combinations in the first word of the Block Transfer Write that configure the module.

Table 5.A
Bit Combinations in Word One of the Block Transfer Write for
Types of Inputs

Input Type	Input Type	Temperature Range °C	Bits for Inputs 5 to 8 (bit 06 must be 1)			Bits for Inputs 1 to 8 (bit 06 must be 0); Bits for Inputs 1 to 4 (bit 06 must be 1)		
			05	04	03	02	01	00
Millivolt	Millivolt	-100 to +100	0	0	0	0	0	0
Thermocouple	B	320 to 1800	1	1	1	1	1	1
	E	-270 to 1000	0	0	1	0	0	1
	J	-210 to 1200	0	1	0	0	1	0
	K	-260 to 1380	0	1	1	0	1	1
	TXK/XK(L)	-200 to 800	1	0	1	1	0	1
	S	-50 to 1770	1	1	0	1	1	0
	TBP/BP(A)-1	-0 to 1800	1	0	0	1	0	0

As with the 1771-IXHR, two different input groups can be selected. You can have 4 inputs set for one input type and 4 inputs set for another input type. If this feature is selected, bit 06 must be set to 1. It is also valid to set bit 06 to 1 and have the same configuration twice as in one complete line of the above list. This is how the I/O edit feature in the PLC-5 programming software does it.

For instance, for a module that uses TXK / XK(L) sensors exclusively, is set to degrees Celsius, and has no sample time setting (RTS), word one of the Block Transfer Write would look thus:

Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word 1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1

The rest of the configuration is identical to the 1771-IXHR module, and is described in the 1771-IXHR manual. Chapters 6, 7 and 8 (Module Status and Input Data, Module Calibration and Troubleshooting) are also identical for both the 1771-IXHR and 1771-IXHRR modules.

Specifications

Number of Inputs	8, all of the same type or 4 each of 2 different types
I/O Chassis Location	Any single I/O module slot
Type of Input (Selectable)	Type B, Pt-30% Rh/Pt-6% Rh (320 to 1800°C) Type E, chromel/constantan (-270 to 1000°C) Type J, iron/constantan (-210 to 1200°C) Type K, chromel/alumel (-260 to 1380°C) Type TXK/XK(L), Ni-9.5%Cr/Cu-44%Ni-13% Rh (-200 to 800°C) Type S, Pt/Pt-10% Rh (-50 to 1770°C) Type TBP/BP(A)-1, W-5%Re/W-20%Re (0 to 1800°C) Millivolt (-100 to +100mV dc)
Thermocouple Linearization	IPTS-68 standard, NBS MN-125
Cold Junction Compensation	Range: 0 to 60°C Accuracy: ±0.5°C
Temperature Scale (Selectable)	°C or °F
Input Resolution	3.2328µV
Display Resolution	0.1°C, 0.1°F; or 1.0µV, 10µV
Input Isolation	1000V peak between inputs, between input and common, and between input and backplane connections
Common Mode Rejection	120dB at 60Hz, up to 1000V peak
Common Mode Impedance	Greater than 10 megohms
Normal Mode Rejection	60dB at 60Hz over ±100mV
Input Overvoltage Protection	120V rms, continuous
Open Input Detection	Open input produces an overrange in less than 10 seconds
Input Connections	18-terminal wiring arm (Cat. No. 1771-WI)
Data Format	2's complement binary
Calibration Methods	Auto - Auto-calibration for offset and gain Manual - Zero offset and gain adjustment for each channel via programming terminal Verify every six months for maintaining absolute accuracy
Processor Compatibility	PLC-3 or PLC-5 family processor using the 1771 I/O structure and block transfer. (Not recommended for use with PLC-2 family processors.)
Environmental Conditions	Operating Temperature: 0 to 60°C (32 to 140°F) Rate of Change: Ambient changes greater than 0.5°C per minute may temporarily degrade performance during periods of change Storage Temperature: -40 to 85°C (-40 to 185°F) Relative Humidity: 5 to 95% (without condensation)
Backplane Power Consumption	750mA @ 5V; 3.75 Watts maximum
Field Wiring Arm	Cat. No. 1771-WI
Keying	Between 20 and 22 Between 24 and 26

Documentation Update

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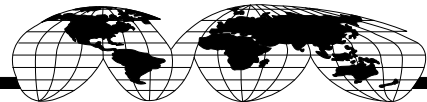
Service

The 1771-IXHR module is meant for the European market. If repair is necessary, contact the European repair center at the following address :

Allen Bradley IAP Repair Center
Denbigh Road
Bletchley Milton Keynes MK13DR
England
Tel.: (44) 908 371144



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