



Block Transfer Write and Block Transfer Read Configurations for 0 Output/8 Input 1771-N Series Modules

Release Notes

What This Release Note Contains

This release note contains block transfer write and block transfer read configurations and bit/word descriptions for 1771-N series modules with no outputs and eight inputs.

Block Transfer Write Configuration Block for 8 Input Modules

| Word/Dec. Bit | 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|-----------------------|--|-------------------------------------|----------|----|----|----------|----|----|-------------------------------|----|----|----|------------|------------|--------|----|
| Word/Octal Bit | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 0 | BTW word type | | Constant | | | | | | Number of outputs | | | | Constant | | | |
| | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | CJ alarm enable | Unused = 0 | | | | | | | | | | | BCD select | Temp scale | Verify | |
| 2 | RTS Sample Time: 1 millisecond units | | | | | | | | | | | | | | | |
| Channel 1 Programming | | | | | | | | | | | | | | | | |
| 3 | Low Scale Value | | | | | | | | | | | | | | | |
| 4 | High Scale Value | | | | | | | | | | | | | | | |
| 5 | Low Alarm Value | | | | | | | | | | | | | | | |
| 6 | High Alarm Value | | | | | | | | | | | | | | | |
| 7 | Alarm enable | Rate Alarm: Scaled Units per second | | | | | | | | | | | | | | |
| 8 | Filter Time Constant: 0.1 second units | | | | | | | | Alarm Deadband | | | | | | | |
| 9 | Thermocouple Type | | | | 0 | RTD Type | | | 10 Ohm Offset; 0.01 Ohm units | | | | | | | |
| Channel 2 Programming | | | | | | | | | | | | | | | | |
| 10 | Low Scale Value | | | | | | | | | | | | | | | |
| 11 | High Scale Value | | | | | | | | | | | | | | | |
| 12 | Low Alarm Value | | | | | | | | | | | | | | | |
| 13 | High Alarm Value | | | | | | | | | | | | | | | |
| 14 | Alarm enable | Rate Alarm: Scaled Units per second | | | | | | | | | | | | | | |
| 15 | Filter Time Constant: 0.1 second units | | | | | | | | Alarm Deadband | | | | | | | |

Release Notes

Block Transfer Write and Block Transfer Read Configurations for 8 Input Modules

| Word/Dec. Bit | 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|-----------------------|--|-------------------------------------|----|----|----|----------|----|----|-------------------------------|----|----|----|----|----|----|----|
| Word/Octal Bit | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 16 | Thermocouple Type | | | | 0 | RTD Type | | | 10 Ohm Offset; 0.01 Ohm units | | | | | | | |
| Channel 3 Programming | | | | | | | | | | | | | | | | |
| 17 | Low Scale Value | | | | | | | | | | | | | | | |
| 18 | High Scale Value | | | | | | | | | | | | | | | |
| 19 | Low Alarm Value | | | | | | | | | | | | | | | |
| 20 | High Alarm Value | | | | | | | | | | | | | | | |
| 21 | Alarm enable | Rate Alarm: Scaled Units per second | | | | | | | | | | | | | | |
| 22 | Filter Time Constant: 0.1 second units | | | | | | | | Alarm Deadband | | | | | | | |
| 23 | Thermocouple Type | | | | 0 | RTD Type | | | 10 Ohm Offset; 0.01 Ohm units | | | | | | | |
| Channel 4 Programming | | | | | | | | | | | | | | | | |
| 24 | Low Scale Value | | | | | | | | | | | | | | | |
| 25 | High Scale Value | | | | | | | | | | | | | | | |
| 26 | Low Alarm Value | | | | | | | | | | | | | | | |
| 27 | High Alarm Value | | | | | | | | | | | | | | | |
| 28 | Alarm enable | Rate Alarm: Scaled Units per second | | | | | | | | | | | | | | |
| 29 | Filter Time Constant: 0.1 second units | | | | | | | | Alarm Deadband | | | | | | | |
| 30 | Thermocouple Type | | | | 0 | RTD Type | | | 10 Ohm Offset; 0.01 Ohm units | | | | | | | |
| Channel 5 Programming | | | | | | | | | | | | | | | | |
| 31 | Low Scale Value | | | | | | | | | | | | | | | |
| 32 | High Scale Value | | | | | | | | | | | | | | | |
| 33 | Low Alarm Value | | | | | | | | | | | | | | | |
| 34 | High Alarm Value | | | | | | | | | | | | | | | |
| 35 | Alarm enable | Rate Alarm: Scaled Units per second | | | | | | | | | | | | | | |
| 36 | Filter Time Constant: 0.1 second units | | | | | | | | Alarm Deadband | | | | | | | |
| 37 | Thermocouple Type | | | | 0 | RTD Type | | | 10 Ohm Offset; 0.01 Ohm units | | | | | | | |
| Channel 6 Programming | | | | | | | | | | | | | | | | |
| 38 | Low Scale Value | | | | | | | | | | | | | | | |
| 39 | High Scale Value | | | | | | | | | | | | | | | |
| 40 | Low Alarm Value | | | | | | | | | | | | | | | |
| 41 | High Alarm Value | | | | | | | | | | | | | | | |
| 42 | Alarm enable | Rate Alarm: Scaled Units per second | | | | | | | | | | | | | | |
| 43 | Filter Time Constant: 0.1 second units | | | | | | | | Alarm Deadband | | | | | | | |
| 44 | Thermocouple Type | | | | 0 | RTD Type | | | 10 Ohm Offset; 0.01 Ohm units | | | | | | | |

| Word/Dec. Bit | 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 | |
|-----------------------|--|-------------------------------------|----|----|----|----------|----|----|----------------|-------------------------------|----|----|----|----|----|----|--|
| Word/Octal Bit | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 | |
| Channel 7 Programming | | | | | | | | | | | | | | | | | |
| 45 | Low Scale Value | | | | | | | | | | | | | | | | |
| 46 | High Scale Value | | | | | | | | | | | | | | | | |
| 47 | Low Alarm Value | | | | | | | | | | | | | | | | |
| 48 | High Alarm Value | | | | | | | | | | | | | | | | |
| 49 | Alarm enable | Rate Alarm: Scaled Units per second | | | | | | | | | | | | | | | |
| 50 | Filter Time Constant: 0.1 second units | | | | | | | | Alarm Deadband | | | | | | | | |
| 51 | Thermocouple Type | | | | 0 | RTD Type | | | | 10 Ohm Offset; 0.01 Ohm units | | | | | | | |
| Channel 8 Programming | | | | | | | | | | | | | | | | | |
| 52 | Low Scale Value | | | | | | | | | | | | | | | | |
| 53 | High Scale Value | | | | | | | | | | | | | | | | |
| 54 | Low Alarm Value | | | | | | | | | | | | | | | | |
| 55 | High Alarm Value | | | | | | | | | | | | | | | | |
| 56 | Alarm enable | Rate Alarm: Scaled Units per second | | | | | | | | | | | | | | | |
| 57 | Filter Time Constant: 0.1 second units | | | | | | | | Alarm Deadband | | | | | | | | |
| 58 | Thermocouple Type | | | | 0 | RTD Type | | | | 10 Ohm Offset; 0.01 Ohm units | | | | | | | |

Block Transfer Write Bit/Word Descriptions for 8 Input Modules

| Word | Decimal Bit (Octal Bit) | Definition |
|--------|-------------------------|--|
| Word 0 | 00–03 | Constant = 0 |
| | Bits 04–07 | Number of outputs = 0000 |
| | Bits 08–13 (10–15) | Constant = 00 1000 binary |
| | Bits 14–15 (16–17) | Block transfer write type = 10 binary |
| Word 1 | Bit 00 | Verify. If this bit is set to 1, the module will compare its current programming with the programming downloaded in the BTW. If they are the same, it will verify good; if they are different, the module will verify bad. In no case will any programming data in the BTW be applied to the module. |
| | Bit 01 | Temperature scale. 0 = Celsius, 1 = Fahrenheit |
| | Bit 02 | BCD select. 1 = all values in BCD format. 0 = all values in 2's complement binary |

Release Notes

Block Transfer Write and Block Transfer Read Configurations for 8 Input Modules

| Word | Decimal Bit (Octal Bit) | Definition |
|------------------|-------------------------|---|
| Word 1 continued | Bits 03–14 (03–16) | Not used. Always 0 |
| | Bit 15 (17) | CJ alarm enable. A value of 1 enables over and underrange indication for the cold junction channel. If the module does not have a cold junction channel, this bit is 0. |
| Word 2 | Bits 00–15 (00–17) | Real time sample. Sample time in milliseconds. 0 = off. RTS minimum is 100msec (counts = 100). Maximum 10 seconds in binary; 9.999 seconds in BCD. |
| Word 3 | Bits 00–15 (00–17) | Low scale value for channel 1. Scale values are limited to ± 32767 in binary format; ± 7999 in BCD format. |
| Word 4 | Bits 00–15 (00–17) | High scale value for channel 1. Scale values are limited to ± 32767 in binary format; ± 7999 in BCD format. |
| Word 5 | Bits 00–15 (00–17) | Low alarm value for channel 1. Alarm values are limited to ± 32767 in binary format; ± 7999 in BCD format. |
| Word 6 | Bits 00–15 (00–17) | High alarm value for channel 1. Alarm values are limited to ± 32767 in binary format; ± 7999 in BCD format. |
| Word 7 | Bits 00–14 (00–16) | Rate alarm. If the channel's input changes at a rate faster than this value and the alarm enable bit is set, the channel will indicate a rate alarm condition. Legal values are from 0.05 to 50% of full scale per second. |
| | Bit 15 (17) | Alarm enable bit. If set to 1, the module will report high alarm, low alarm, underrange, overrange, and rate alarm conditions. If 0, these warnings are suppressed. |
| Word 8 | Bits 00–07 | Alarm deadband. This field creates a hysteresis effect on the low and high alarms. For an alarm condition to be removed, the input signal must go above the low alarm limit or below the high alarm limit by an amount equal to the specified deadband. Alarm deadband values must be less than or equal to one half the difference of the high and low alarm values. |
| | Bits 08–15 (10–17) | Filter time constant. Specifies the time constant of a digital, first order lag filter on the input in 0.1 second units. Legal values are 0.1 to 9.9 seconds. A value of 0 disables the filter. |
| Word 9 | Bits 00–07 | 10 ohm offset. Compensates for a resistance offset on a 10 ohm copper RTD. Range of ± 0.99 ohms, in units of 0.01 ohms. This field must be 0 for all other RTDs. |
| | Bits 08–10 (10–12) | RTD type. Specifies type of RTD linearization on RTD channels: 001 = 100 ohm Pt, European standard; 010 = 100 ohm Pt, US standard; 011 = 10 ohm copper; 100 = 120 ohm nickel. This field is 0 for non-RTD channels. |
| | Bit 11 (13) | Constant = 0 |

Release Notes

Block Transfer Write and Block Transfer Read Configurations for 8 Input Modules

| Word | Decimal Bit (Octal Bit) | Definition |
|------------------|-------------------------|--|
| Word 9 continued | Bits 12–15 (14–17) | Thermocouple type. Specifies type of TC linearization on TC channels. 0000 = millivolts; 0001 = B; 0010 = E; 0011 = J; 0100 = K; 0101 = R; 0110 = S; 0111 = T; 1000 = C (1771-NT2 only); 1001 = N (1771-NT2 only). This field must be 0 for non-thermocouple channels. |
| Words 10 thru 16 | | Same as words 3 thru 9 but for channel 2. |
| Words 17 thru 23 | | Same as words 3 thru 9 but for channel 3. |
| Words 24 thru 30 | | Same as words 3 thru 9 but for channel 4. |
| Words 31 thru 37 | | Same as words 3 thru 9 but for channel 5. |
| Words 38 thru 44 | | Same as words 3 thru 9 but for channel 6. |
| Words 45 thru 51 | | Same as words 3 thru 9 but for channel 7. |
| Words 52 thru 58 | | Same as words 3 thru 9 but for channel 8. |

Block Transfer Read Word Assignments for 8 Input Modules

| Word/Dec. Bit | 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|------------------|---|----------------|-----------|--------------|-----------|----------------|-----------|----------|------------|------------|------------|-----------|------------|----------------|-----------------|----|
| Word/Octal Bit | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 0 | Constant = 8800 Hexadecimal | | | | | | | | | | | | | | | |
| 1 | Power up | Bad Chan. Data | Mod Alarm | RTS Time out | I/O Reset | Program Verify | Mod Fault | Bad Prog | Bad Struct | Unused = 0 | | | | | | |
| 2 | 1 | Unused = 0 | | | | | | | | | | | | CJC Over Range | CJC Under Range | |
| 3 | Cold Junction Temperature; Units of 0.01 degrees C or 0.1 degrees F | | | | | | | | | | | | | | | |
| Channel 1 Status | | | | | | | | | | | | | | | | |
| 4 | 1 | Unused = 0 | | | | | Bad Calib | Bad Prog | 0 | Rate Alarm | High Alarm | Low Alarm | Unused = 0 | Over Range | Under Range | |
| 5 | Channel 1 Input Data | | | | | | | | | | | | | | | |
| Channel 2 Status | | | | | | | | | | | | | | | | |
| 6 | 1 | Unused = 0 | | | | | Bad Calib | Bad Prog | 0 | Rate Alarm | High Alarm | Low Alarm | Unused = 0 | Over Range | Under Range | |
| 7 | Channel 2 Input Data | | | | | | | | | | | | | | | |
| Channel 3 Status | | | | | | | | | | | | | | | | |
| 8 | 1 | Unused = 0 | | | | | Bad Calib | Bad Prog | 0 | Rate Alarm | High Alarm | Low Alarm | Unused = 0 | Over Range | Under Range | |

Release Notes

Block Transfer Write and Block Transfer Read Configurations for 8 Input Modules

| Word/Dec. Bit | 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|------------------|----------------------|------------|----|----|----|----|-----------|----------|----|------------|------------|-----------|------------|----|------------|-------------|
| Word/Octal Bit | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 9 | Channel 3 Input Data | | | | | | | | | | | | | | | |
| Channel 4 Status | | | | | | | | | | | | | | | | |
| 10 | 1 | Unused = 0 | | | | | Bad Calib | Bad Prog | 0 | Rate Alarm | High Alarm | Low Alarm | Unused = 0 | | Over Range | Under Range |
| 11 | Channel 4 Input Data | | | | | | | | | | | | | | | |
| Channel 5 Status | | | | | | | | | | | | | | | | |
| 12 | 1 | Unused = 0 | | | | | Bad Calib | Bad Prog | 0 | Rate Alarm | High Alarm | Low Alarm | Unused = 0 | | Over Range | Under Range |
| 13 | Channel 5 Input Data | | | | | | | | | | | | | | | |
| Channel 6 Status | | | | | | | | | | | | | | | | |
| 14 | 1 | Unused = 0 | | | | | Bad Calib | Bad Prog | 0 | Rate Alarm | High Alarm | Low Alarm | Unused = 0 | | Over Range | Under Range |
| 15 | Channel 6 Input Data | | | | | | | | | | | | | | | |
| Channel 7 Status | | | | | | | | | | | | | | | | |
| 16 | 1 | Unused = 0 | | | | | Bad Calib | Bad Prog | 0 | Rate Alarm | High Alarm | Low Alarm | Unused = 0 | | Over Range | Under Range |
| 17 | Channel 7 Input Data | | | | | | | | | | | | | | | |
| Channel 8 Status | | | | | | | | | | | | | | | | |
| 18 | 1 | Unused = 0 | | | | | Bad Calib | Bad Prog | 0 | Rate Alarm | High Alarm | Low Alarm | Unused = 0 | | Over Range | Under Range |
| 19 | Channel 8 Input Data | | | | | | | | | | | | | | | |
| 20-27 | For factory use only | | | | | | | | | | | | | | | |

Block Transfer Read Bit/Word Descriptions for 8 Input Modules

| Word | Decimal Bit (Octal Bit) | Definition |
|--------|----------------------------|---|
| Word 0 | Bits 00–15 (00–17) | Always = 8800 hexadecimal |
| Word 1 | Bits 00–05 | Not used |
| | Bit 06 | Bad structure. This bit is set if there is an error in the BTW header. |
| | Bit 07 | Bad program. This bit is set if any of the module level programming data is illegal. |
| | Bit 08 (10) | Module fault. This bit is set if any of the programming data sent to the module in the most recent BTW was illegal, or if one or more channels has the bad calibration bit set. |
| | Bits 09–10 (11–12) | Program verify. Indicates the result of verify request. 00 = verify not requested; 10 = verify failed; 11 = verify succeeded |
| | Bit 11 (13) | I/O reset. This bit is set whenever the I/O reset line on the backplane is asserted. |
| | Bit 12 (14) | RTS timeout. This bit is set if a BTR was not requested of the module within the RTS sample time. |
| | Bit 13 (15) | Module alarm. This bit is set if there is an alarm bit set for one or more channels. The input alarm bits are low, high alarm and rate alarm. The output channel alarm bits are low and high clamp, and the rate limit alarm. |
| | Bit 14 (16) | Bad channel data. This bit is set if the module is in BCD mode and one or more of the input data values sent in the last BTW are not a legal BCD value. |
| | Bit 15 (17) | Powerup bit. This bit is set until a BTW with programming data is received by the module. |
| Word 2 | Bit 00 | Cold junction compensation (CJC) underrange bit. This bit is set if the CJC temperature is below 0°C. |
| | Bit 01 | Cold junction compensation (CJC) overrange bit. This bit is set if the CJC temperature is above 70°C. |
| | Bits 02–14 (02–16) | Not used. Always 0 |
| | Bit 15 (17) | Always = 1 |
| Word 3 | Bits 00–15 (00–17) | Cold junction temperature. Units of 0.01 degrees C or 0.1 degrees F. (0.1 degrees C or 1.0 degrees F in BCD.) |
| Word 4 | Bit 00 | Underrange bit. This bit is set if the input signal is below the input channels minimum range. |
| | Bit 01 | Overrange bit. This bit is set if the input signal is above the input channels maximum range. |
| | Bits 02–03 | Not used. Always 0 |

Release Notes

Block Transfer Write and Block Transfer Read Configurations for 8 Input Modules

| Word | Decimal Bit (Octal Bit) | Definition |
|------------------|-------------------------|--|
| Word 4 continued | Bit 04 | Low alarm. This bit is set if alarms are enabled and the input data is lower than the low alarm setpoint. |
| | Bit 05 | High alarm. This bit is set if alarms are enabled and the input data is higher than the high alarm setpoint. |
| | Bit 06 | Rate alarm. This bit is set if the input signal changed at a rate faster than the input rate alarm setpoint. |
| | Bit 07 | Not used. Always 0 |
| | Bit 08 (10) | Bad program. This bit is set if any of the channel level programming data is illegal. |
| | Bit 09 (11) | Bad calibration. This bit is set if the channel has not had a valid calibration. |
| | Bits 10–14 (12–16) | Not used. Always 0 |
| | Bit 15 (17) | Not used. Always = 1 |
| Word 5 | Bits 00–15 (00–17) | Channel 1 input data. |
| Words 6 and 7 | | Same as words 4 and 5 but for Channel 2 |
| Words 8 and 9 | | Same as words 4 and 5 but for Channel 3 |
| Words 10 and 11 | | Same as words 4 and 5 but for Channel 4 |
| Words 12 and 13 | | Same as words 4 and 5 but for Channel 5 |
| Words 14 and 15 | | Same as words 4 and 5 but for Channel 6 |
| Words 16 and 17 | | Same as words 4 and 5 but for Channel 7 |
| Words 18 and 19 | | Same as words 4 and 5 but for Channel 8 |
| Words 20 thru 27 | | For factory use only |



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