

## PRODUCT/TEST MANUAL

# 1X200K2

## TRANSFORMER CONTROL MODULE



Order Number

Serial Number

Issue	Date	Summary of changes
A	18/11/2002	Initial issue.

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## 1.0 BROAD DESCRIPTION

The 1X200 is an I/O module, programmed to perform interface and logic control functions in a 1M122 Transformer Parallel Control Scheme.

A crystal driven micro controller is employed to provide accurate timing and flexible functionality.

Each transformer has a 1X200 control module to allow:

- .. A transformer to be placed in OFF mode;
- .. A transformer to be placed in LOCAL mode;
- .. Manual Raise or Lower of the Tap Position in LOCAL mode;
- .. A transformer to be placed In AUTO mode;
- .. A transformer to be placed in REMOTE control mode.

All push buttons are momentary action. LED's are employed to provide status indication. Separate inputs & status output repeat contacts are provided for each button for RTU integration.

## 2.0 SPECIFICATIONS

### 2.1 Burdens

Auxiliary Supply Voltage	40 - 275 V AC , 40 - 300 VDC
Auxiliary Supply Burden (at 125V)	<7W output relay dropped out <10W output relay picked up

### 2.2 Initiates

Group 1	24 - 80VDC
Group 2	24 - 80VDC
Group 3	24 - 80VDC

### 2.3 Output Contacts and Ratings

Group 1	3 N/O
Group 2	6 N/O
Group 3	2 N/O

1 C/O contact for the power supply fail.

#### 2.3.1 Make & Carry

30A AC or DC (Limits L/R=40ms & 300V max.) for 0.2s  
20A AC or DC (Limits L/R=40ms & 300V max.) for 0.5s  
5A AC or DC continuously

#### 2.3.2 Break (Limits 5A & 300V max.)

1,250VA AC resistive  
250VA at 0.4PF AC inductive  
75W DC resistive  
30W DC inductive L/R = 40ms  
50W DC inductive L/R = 10ms

#### 2.3.3 Minimum recommended load

0.5W, 10mA or 5V minimum.

### 2.4 Relay Fail Alarm

A C/O alarm contact is maintained in the energized state when all of the following conditions are met:

- The auxiliary supply is healthy.

## 2.5 Ambient Operating Temperature Range

-5 to 55 degrees C.

## 2.6 Insulation Withstand

IEC60255-5 2KV RMS & 1.2/50 5KV impulse between:

All input terminals (**excluding terminal 2**) & frame.

All output terminals (**excluding terminal 2**) & frame.

All input (**excluding terminal 2**) & output terminals

Each input group.

Each output group.

## 2.7 High Frequency Disturbance

IEC60255-22-1 2.5KV 1MHz common mode

1.0KV 1MHz differential mode

## 2.8 Electrostatic Discharge

EN61000-4-2:1995 8KV Level 3

## 2.9 Radio Frequency Interference

EN61000-4-3:1995 10V/m Level 3

## 2.10 Fast Transient Disturbance

EN61000-4-4:1995 4KV Level 4

## 3.0 AUXILIARY SUPPLY

40-275V AC / 40-300V DC switchmode power supply

Burden: Less than 7 watts.

## 3.1 Inputs

A high efficiency switchmode power supply is incorporated which provides a low burden to the auxiliary supply.

## 3.2 Input Transients

Withstands multiple high-energy transients & ring waves in accordance with IEEE28 - ANSI C26.1 Cat. II, accordingly:

- 0.5uS 100KHz 6KV O/C, 500A S/C, 4J
- 1.2/50uS 6Kv O/C
- 8/20uS 3KA S/C, 80J clamped at 1,000V

Mains conducted EMI within limits specified by AS 3548 Class B.

## 3.3 Isolation

The inputs are isolated from the outputs in accordance with AS3260 Class II Limited Current Circuitry, accordingly:

- Withstand voltage of 2.5Kv RMS 50Hz for one minute
- Creepage & clearance distance greater than 4mm
- Output leakage current less than 0.25A to earth

## 3.4 Output Protection

Outputs will withstand continuous short circuit. Output regulators & switching control regulator are thermally protected.

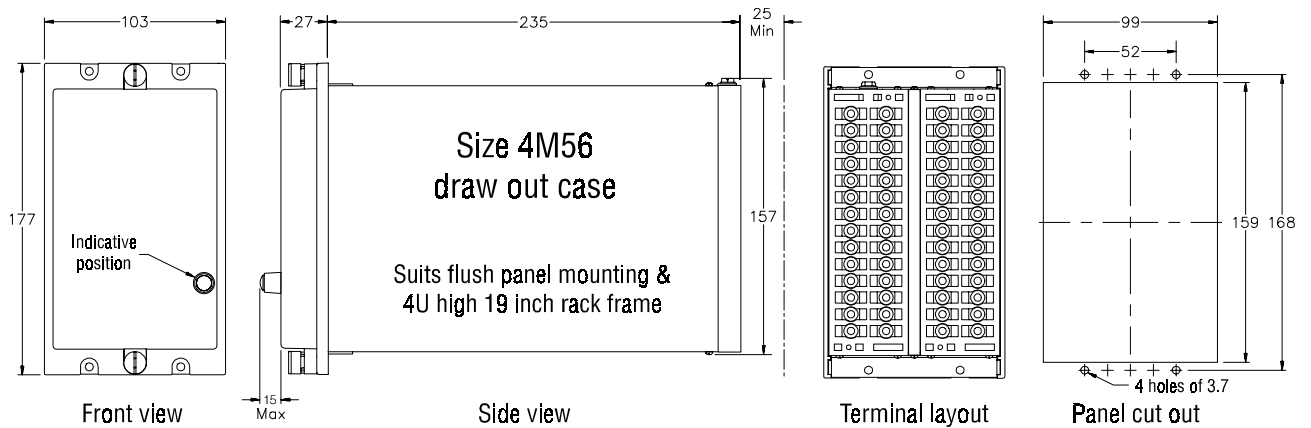
### 3.5 Case

Size 4 draw out

56 M4 screw terminals

Flush panel mount or 4U high 1/4 width 19 inch rack mount

IP51 rating



### 3.6 Accessories supplied with each relay

1 x M4 self threading mounting screw kit P/N 290-406-151

2 x M4 terminal screw kit (28 per kit) P/N 290-407-153

1 x Product Test Manual

#### 4.0 TEST EQUIPMENT REQUIRED

Auxiliary and Inputs Supply  
 Digital Voltmeter  
 High Voltage Test Equipment

#### 5.0 ASSOCIATED DRAWINGS

156-200-101 Wiring Diagram  
 660-338-201 Primary board circuit diagram.  
 660-339-201 Secondary board and front panel circuit diagram

#### 6.0 HIGH VOLTAGE TESTING

- a) Apply 2KV RMS 50 Hz between terminal groups 1 and 2 in Table 1 for 1 minute.
- b) Apply 3 5KV 1/50us pulses of each polarity between terminal groups 1 and 2 in Table 1.

**TABLE 1**

<b>Group 1</b>	<b>Group 2</b>
1,3,11,13,15,17,19,21,23,25,27,12,14,16,18	24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56
1,3,23,25,27,24,26,28,38,40,42,44,46,48,50	11,13,15,17,19,21,12,14,16,18,30,32,34,36,52,54,56
1,3,11,13,15,17,19,21,24,26,28,30,32,34,36	23,25,27,12,14,16,18,38,40,42,44,46,48,50,52,54,56
All terminals – excluding terminal 2	Frame

## 7.0 CALIBRATION & TEST PROCEDURE

### 7.1 Power Supply.

Test the Switchmode Power Supply as per PCI-150

### 7.2 I/O verification.

Load the 1X200 with the test firmware 1X200\_TST\_8515\_xxx.HEX as per PCI-153

#### 7.2.2 Performing the button tests.

- Each front panel button will activate a LED and a relay output according to the following table:

BUTTON	LED	RELAY OUTPUT
Auto/Remote	Auto/Remote	Auto Repeat (42)
Off	Off	Off Repeat (38)
Manual/Local	Manual/Local	Local Repeat (40)
Raise	Raise	Tap Change Raise (52)
Lower	Lower	Tap Change Lower (54)

- Pressing both the "Raise" and the "Lower" buttons together will activate the "AVR Inhibit" relay output (30) only.
- Pressing both the "Auto" and the "Off" buttons together will activate all LEDs and all relay outputs.

#### 7.2.3 Performing the digital input tests.

- Each digital input will activate a LED and a relay output according to the following table:

DIGITAL INPUT	LED	RELAY OUTPUT
Set to Remote (15)	Remote Control On	Remote Repeat (46)
Set to Group A (16) and press "Auto Remote" button	Group A	Group A Repeat (48) & Group A Online (34)
Set to Group B (18) and press "Auto Remote" button	Group B	Group B Repeat (50) & Group B Online (36)
Set to Auto (17)	Auto/Remote	Auto Repeat (42)
Set to Off (21)	Off	Off Repeat (38)
Set to Local (19)	Manual/Local	Local Repeat (40)
TFR Raise (24)	Raise	Tap Change Raise (52)
TFR Lower (28)	Lower	Tap Change Lower (54)

- Activating both the "TFR Raise" and the "TFR Lower" inputs together will activate the "AVR Inhibit" relay output (30) only.
- Activating both the "Set to Auto" and the "Set to Off" inputs together will activate all LEDs and all relay outputs.

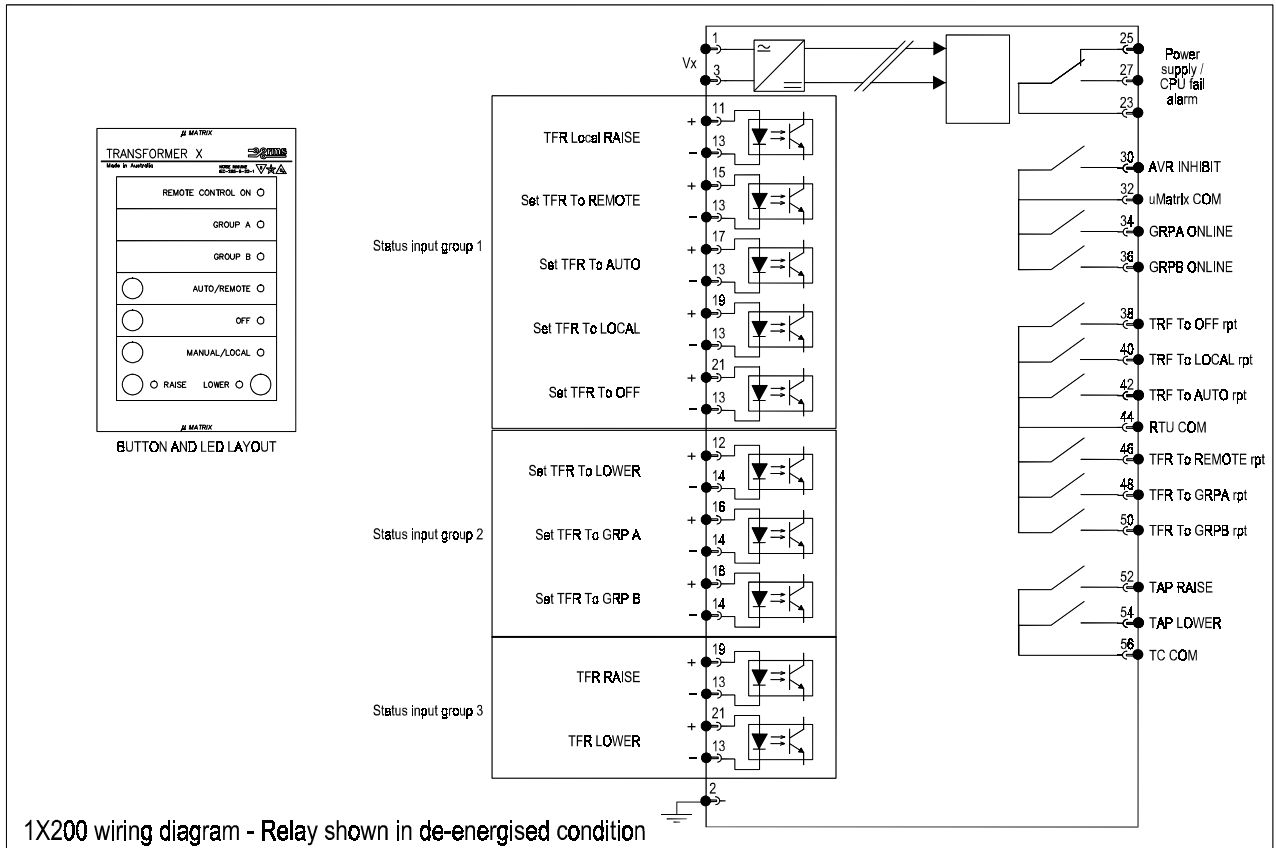
PASS



Load the 1X200 with the firmware 1X200\_A\_8515\_xxx.HEX as per PCI-153

TESTED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

8.0 CONNECTION DIAGRAM



1X200 wiring diagram - Relay shown in de-energised condition