

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.

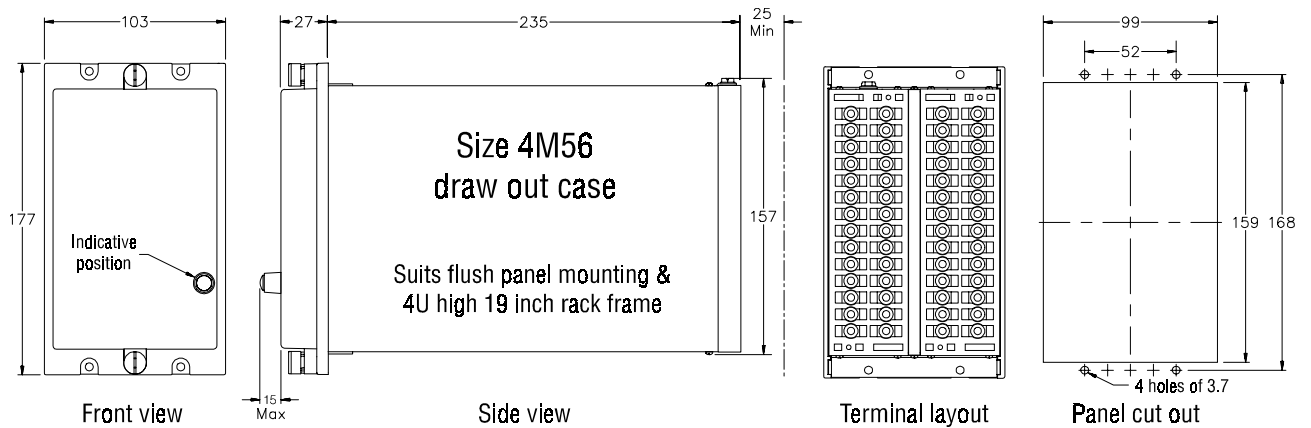
3.5 Case

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

Group 1	Group 2
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.

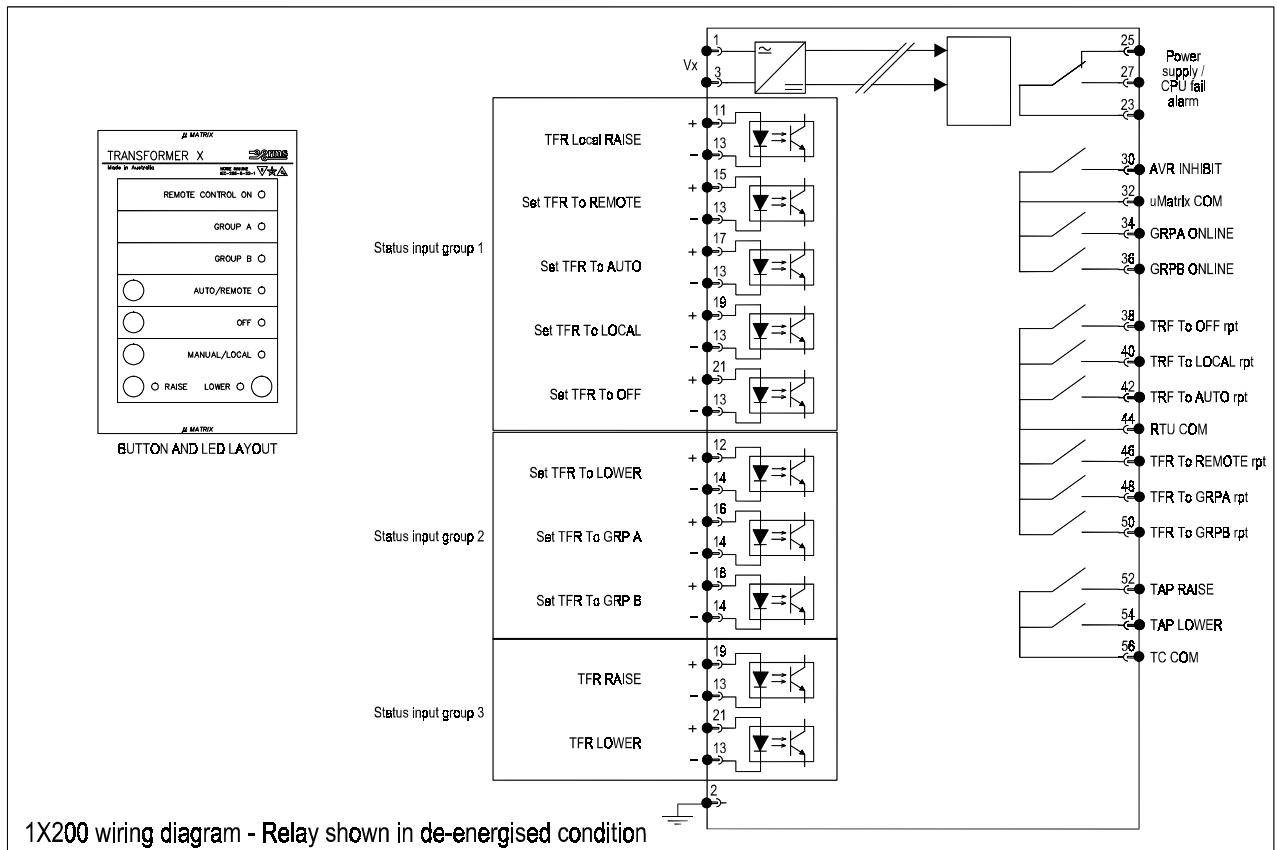
PASS



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