RMS Mors Smitt
A Wabtec company

4D200 User Guide

TPI Display Module

relay monitoring systems pty ltd

Advanced Protection Devices

User Guide

4D200 User Guide

About This Manual

This User Guide covers all 4D200 relays manufactured from July 2019. Earlier relays do not necessarily incorporate all the features described. Our policy of continuous may means that extra features & functionality may have been added.

The 4D200 User Guide is designed as a generic document to describe the common operating parameters for all relays built on this platform. Some relay applications are described but for specific model information the individual “K” number Product / Test manuals should be consulted.

Contact Us

© Relay Monitoring Systems Pty Ltd 2001-2019
6 Anzed Court • Mulgrave 3170 • AUSTRALIA
Phone 61 3 8544 1200 • Fax 61 3 8544 1201
Email sales.rms@wabtec.com • Web www.rmspl.com.au

How this guide is organised

This guide is divided into five parts:

Part 1 Documentation

Part 2 Configuration

Introduction

Configuration Settings

- **Frequency Input Version (4D200-A)**
- **BCD/BIN Input Versions (4D200-C, 4D200-D)**

Part 3 Installation

Handling of Electronic Equipment

Safety

Equipment Connections

Part 4 Maintenance

Inspection

Documentation

Technical Bulletin

The detailed technical attributes, functional description & performance specifications for the 4D200 are described in the product Technical Bulletin. For the most up to date version go to:

www.rmspl.com.au

The order of precedence for product information is as follows:

- Technical Bulletin
- User Guide

User Guide

This User Guide covers all 4D200 relay versions & describes the generic features & attributes common across all versions.

Different relay versions are required to cater for varying customer requirements such as auxiliary voltage range, I/O configuration, case style, relay functionality etc.

Configuration

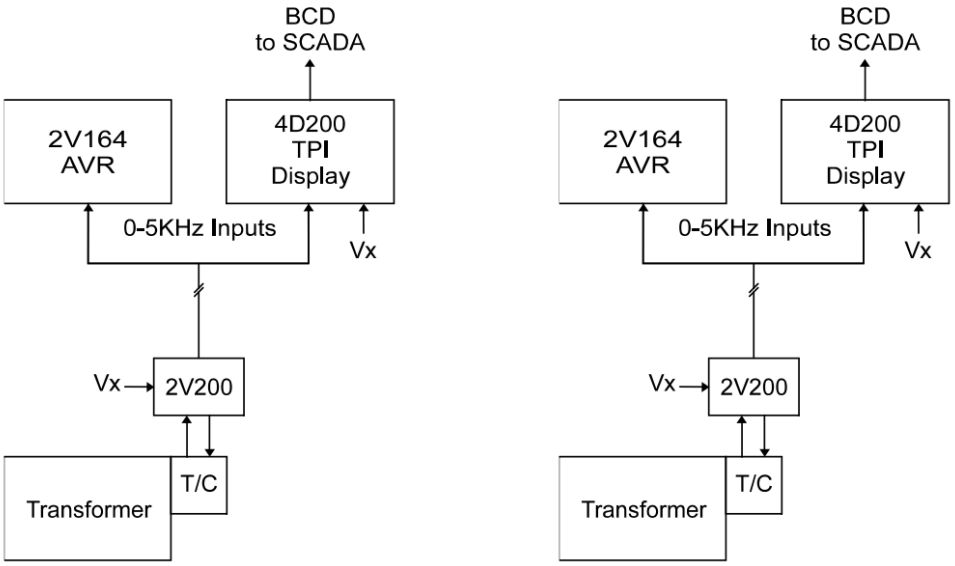
Introduction

The 4D200 is a panel mount module for the display of a power transformer tap position over the range TAP 1 to TAP 30.

The 4D200 may ordered to accept a frequency input signal from a 2V200.

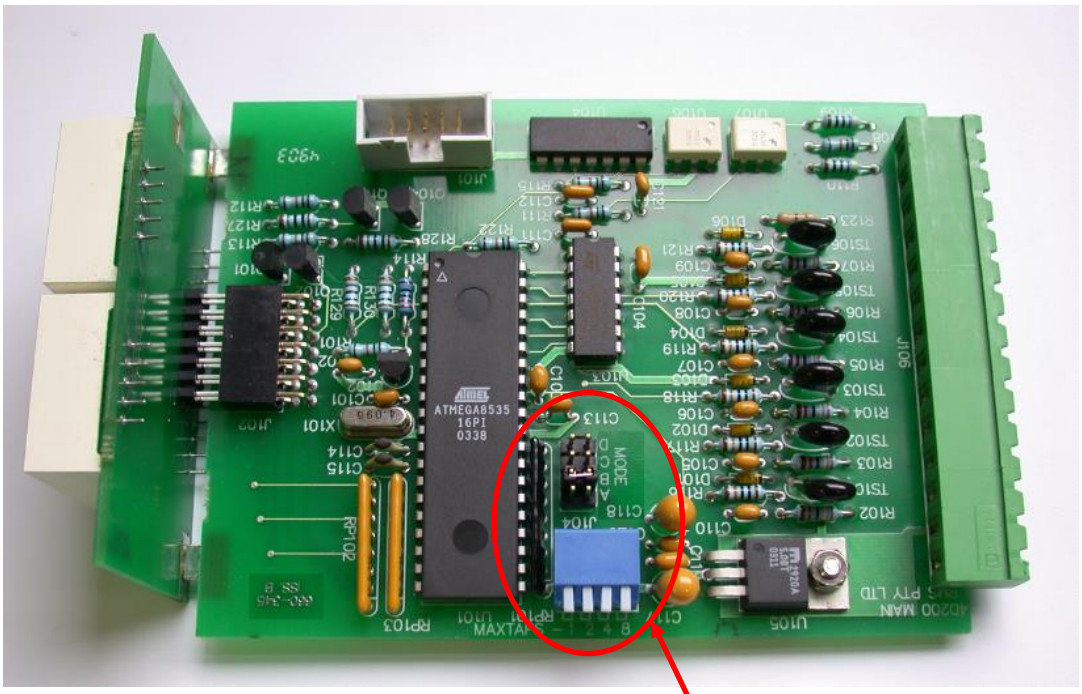
Alternatively, the 4D200 may be ordered to accept a BCD / BIN coded input direct from the tap changer or via a voltage to BCD / BIN transducer.

The respective applications are depicted below:



Configuration Settings

To configure the 4D200, the case is opened to access a dip switch and jumpers. The picture below identifies the location of the dip switch and jumpers:

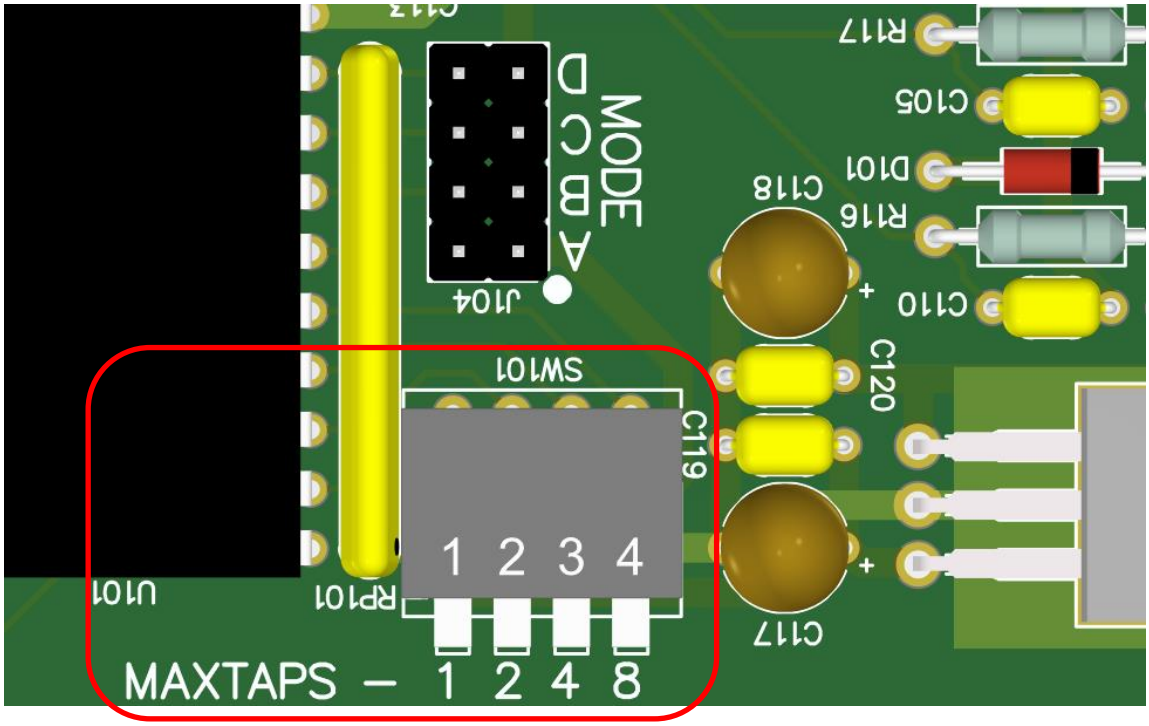


Frequency Input Version (4D200-A)

On this version of 4D200 the maximum tap number needs to be set and the mode jumper setting needs to be verified.

The mode jumper link **B** must be fitted and links A and D must **not** be fitted.

The Max Tap DIP switch positions represent binary code [1 2 4 8] refer PCB screen shot below:



To this DIP switch total, you add 15. Available dip switch settings are shown below:

Tap Maximum	MAXTAPS			
	1	2	4	8
15	OFF	OFF	OFF	OFF
16	ON	OFF	OFF	OFF
17	OFF	ON	OFF	OFF
18	ON	ON	OFF	OFF
19	OFF	OFF	ON	OFF
20	ON	OFF	ON	OFF
21	OFF	ON	ON	OFF
22	ON	ON	ON	OFF
23	OFF	OFF	OFF	ON
24	ON	OFF	OFF	ON
25	OFF	ON	OFF	ON
26	ON	ON	OFF	ON
27	OFF	OFF	ON	ON
28	ON	OFF	ON	ON
29	OFF	ON	ON	ON
30	ON	ON	ON	ON

This system allows:

- A minimum number of Taps = 15 → binary code DIP switch set to [0 0 0 0]
- A maximum number of Taps = 30 → binary code DIP switch set to [1 1 1 1]

Example

- A Max taps of 17 would be set as → binary code DIP switch set to [0 1 0 0]

A mismatch between the displayed and actual tap positions may indicate an incorrect Max taps setting.

BCD/BIN Input Versions (4D200-C, 4D200-D)

On these versions of 4D200 the mode jumper setting needs to be verified.

For **BCD** input there must be no jumper links fitted (A, B, C and D).

For **BIN** input the mode jumper link **C** must be fitted. Links A, B and D must **not** be fitted.

Note: it is not necessary to set a MAXTAPS on these 4D200 versions.

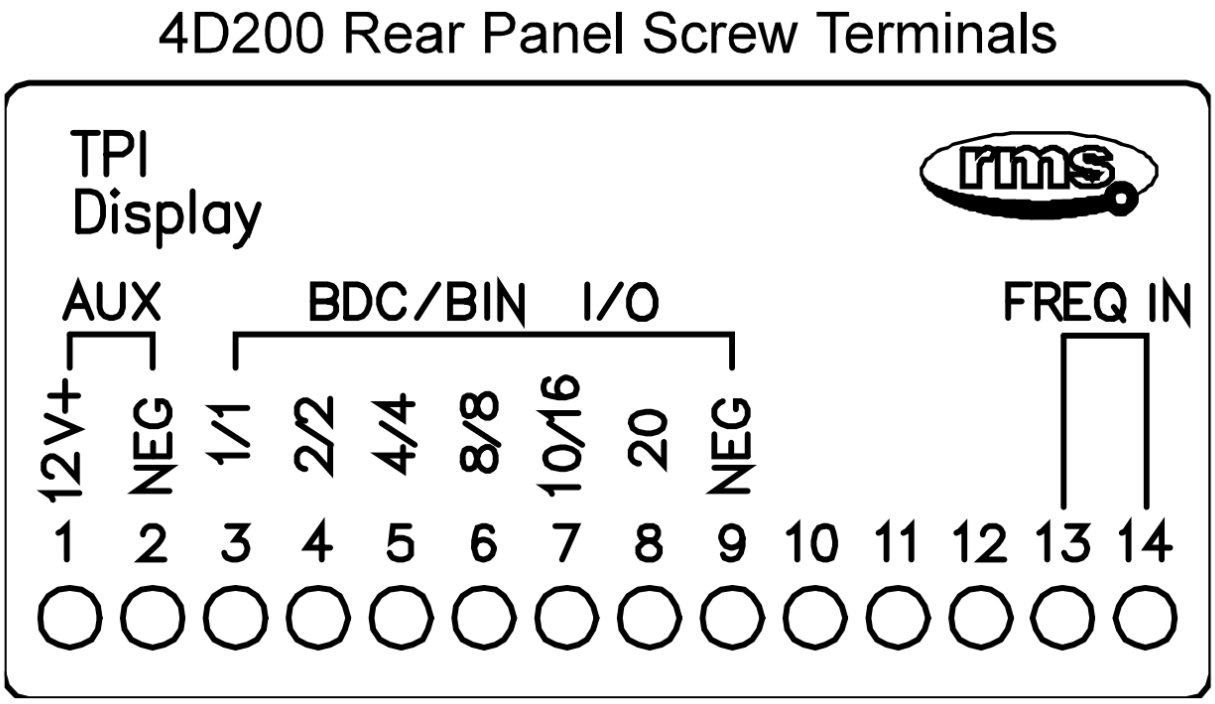
Troubleshooting:

If the Tap changer outputs a Binary signal, but the 4D200 is configured for BCD, the 4D200 will display tap positions 1-9 correctly and after position 9 it will display "- - ".

If the Tap changer outputs a BCD signal, but the 4D200 is configured for Binary, the 4D200 will display numbers, but they will not correlate to the actual tap position.

Installation

Relay Label Depicting Product Connections



Handling of Electronic Equipment

A person's normal movements can easily generate electrostatic potentials of several thousand volts. Discharge of these voltages into semiconductor devices when handling electronic circuits can cause serious damage, which often may not be immediately apparent but the reliability of the circuit will have been reduced.

The electronic circuits of Relay Monitoring Systems Pty Ltd products are immune to the relevant levels of electrostatic discharge when housed in the case. Do not expose them to the risk of damage by withdrawing modules unnecessarily.

Each module incorporates the highest practicable protection for its semiconductor devices. However, if it becomes necessary to withdraw a module, the following precautions should be taken to preserve the high reliability and long life for which the equipment has been designed and manufactured.

1. Before removing a module, ensure that you are at the same electrostatic potential as the equipment by touching the case.
2. Handle the module by its front-plate, frame, or edges of the printed circuit board.
3. Avoid touching the electronic components, printed circuit track or connectors.
4. Do not pass the module to any person without first ensuring that you are both at the same electrostatic potential. Shaking hands achieves equipotential.
5. Place the module on an antistatic surface, or on a conducting surface which is at the same potential as yourself.
6. Store or transport the module in a conductive bag.

If you are making measurements on the internal electronic circuitry of an equipment in service, it is preferable that you are earthed to the case with a conductive wrist strap.

Wrist straps should have a resistance to ground between 500k – 10M ohms. If a wrist strap is not available, you should maintain regular contact with the case to prevent the build up of static.

Instrumentation which may be used for making measurements should be earthed to the case whenever possible.

Safety Section

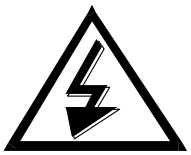
This Safety Section should be read before commencing any work on the equipment.

Explanation of Symbols & Labels

The meaning of symbols and labels which may be used on the equipment or in the product documentation, is given below.

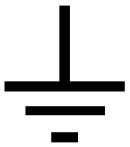
Caution: refer to product information

Caution: risk of electric shock



Functional earth terminal

Note: this symbol may also be used for a protective/safety earth terminal if that terminal is part of a terminal block or sub-assembly eg. power supply.



Storage & Handling

If damage has been sustained a claim should immediately be made against the carrier, also inform Relay Monitoring Systems Pty Ltd and the nearest RMS agent

When not required for immediate use, the relay should be returned to its original carton and stored in a clean, dry place.

Equipment Connections

Personnel undertaking installation, commissioning or servicing work on this equipment should be aware of the correct working procedures to ensure safety. The product documentation should be consulted before installing, commissioning or servicing the equipment.

Terminals exposed during installation, commissioning and maintenance may present hazardous voltage unless the equipment is electrically isolated.

If there is unlocked access to the rear of the equipment, care should be taken by all personnel to avoid electric shock or energy hazards.

Voltage and current connections should be made using insulated crimp terminations to ensure that terminal block insulation requirements are maintained for safety. To ensure that wires are correctly terminated, the correct crimp terminal and tool for the wire size should be used.

Before energising the equipment, it must be earthed using the protective earth terminal, or the appropriate termination of the supply plug in the case of plug connected equipment. Omitting or disconnecting the equipment earth may cause a safety hazard.

The recommended minimum earth wire size is 2.5mm^2, unless otherwise stated in the technical data section of the product documentation.

Before energising the equipment, the following should be checked:

1. Voltage rating and polarity;
2. CT circuit rating and integrity of connections;
3. Protective fuse rating;
4. Integrity of earth connection (where applicable)

Equipment Operating Conditions

The equipment should be operated within the specified electrical and environmental limits.

Decommissioning & Disposal

Decommissioning: The auxiliary supply circuit in the relay may include capacitors across the supply or to earth. To avoid electric shock or energy hazards, after completely isolating the supplies to the relay (both poles of any dc supply), the capacitors should be safely discharged via the external terminals prior to decommissioning.

Disposal: Avoid incineration and disposal into water courses. The product should be disposed of in a safe manner.

Maintenance

Mechanical Inspection

Relay Assembly

Inspect the relay for obvious signs of damage or ingress of moisture or other contamination.

Relay Module

Isolate the relay.

Care must be taken to avoid subjecting the relay element to static discharge which may damage or degrade sensitive electronic components.

Inspect the relay module for signs of any overheating or burn marks which may have been caused by overvoltage surge or transient conditions on the power supply or digital status inputs.