Digital Tapchanger Control TCC300
Digital Tapchanger Control for transformers and regulators

The TCC300 is a dedicated controller for metering, monitoring, and operational control of step-voltage load tap changers. The TCC300 is a microprocessor-based package suitable for substation transformers with on-load tap changers. The TCC300 can be easily integrated to replace electromechanical on-load tap changer controllers or for new installations requiring state-of-the-art controllers. The TCC300 provides reliable operation with expanding capabilities such as means to address distributed generation and cyber security requirements.

Benefits

- Adapter panels to retrofit popular industry tapchanger controls
- USB 1.1 Communications Port for quick field-updatable programming
- Smart Reverse Power detection/operation with VT configuration for source and load sides
- Demand metering/Data Logging with Date/Time Stamp (Single/Three-Phase)
- Harmonic Analysis
- LDC with R & X or Z-compensation
- SCAMP (SCADA Controllable Auto/Manual Pushbutton) Adapter Panel Auto/Manual Switch State can be changed by a SCADA command
- Sequence of Events Recording
- SCADA HeartBeat
- Smart Flash SD Card
- Source PT Voltage Input
- CBEMA Monitoring
- VAr Bias for downstream coordination with capacitor controls
- Tap position knowledge by four KeepTrack™ methods
- Transformer paralleling by circulating current, Master/Follower (peer to peer) circuitry, or ΔVAR® methods
- LCD display (rated –20 to +70 degrees Celsius) or Vacuum Fluorescent display optionally available (rated -40 to +80 degrees Celsius)
- Optional Control Power Backup Input for Fiber Optic communication loop-through
- DNP3.0, MODBUS® and IEC 61850 Communications Protocols available
- Optional Ethernet RJ45 or Fiber Optic Ethernet

Features

The TCC300 includes the following features and can be used for LTCs or regulators where SCADA communications are desired.

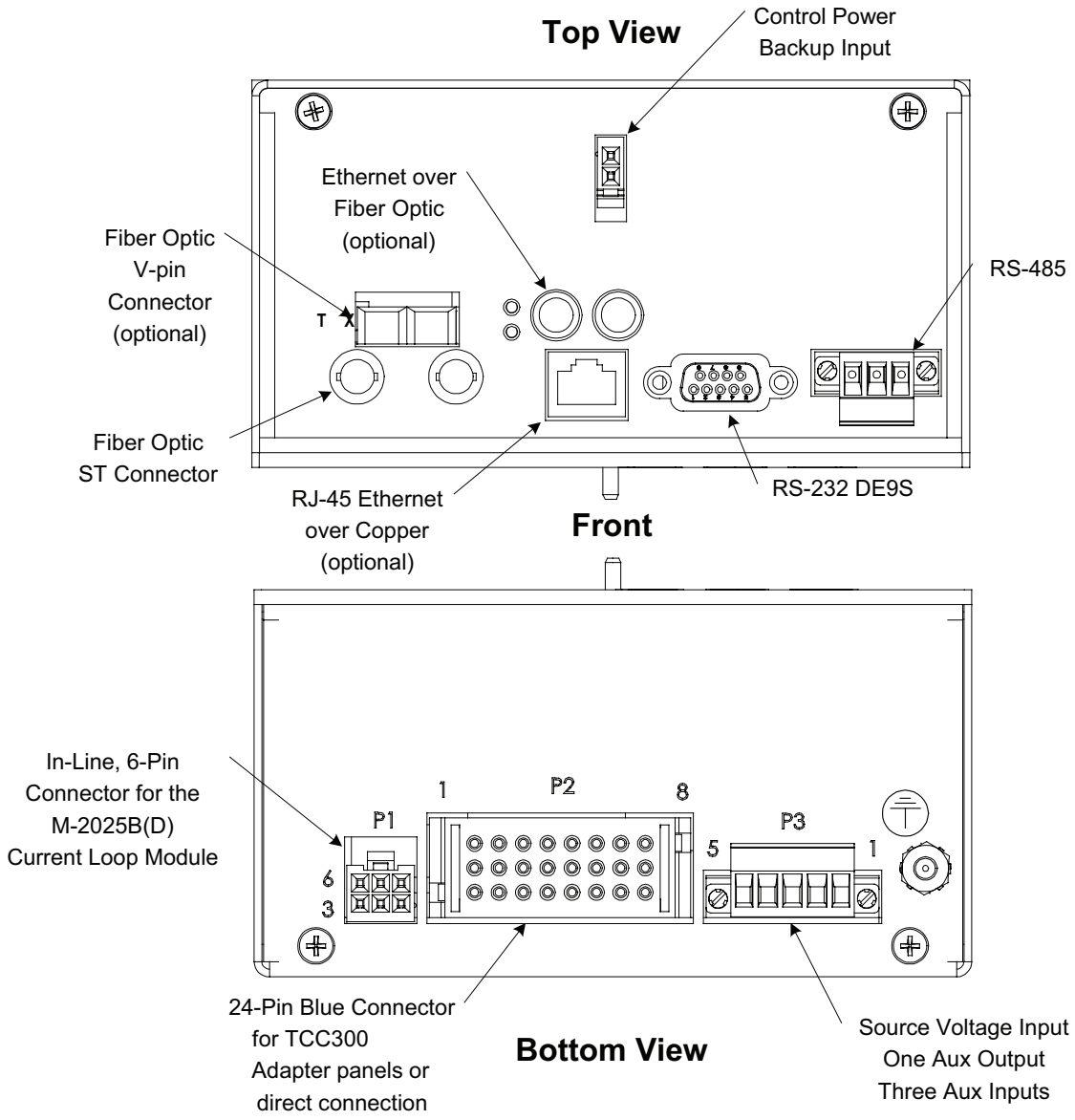
- Adjustable Bandcenter
- Adjustable Bandwidth
- Adjustable VAr Bias (Step and Linear Methods)
- Line Drop Compensation, R, X and Z Compensation with ±72 Volt range
- Time Delay, Definite and Inverse
- Intertap Time Delay
- Four Settings Profiles
- Selectable Outputs, Continuous or Pulsed
- Reverse Power Operation with eight control selections including a distributed generation mode and Smart Reverse Power Operation with two Auto Determination modes
- CT to VT Phasing Correction
- Real-Time Metering of measured and calculated parameters (Single/Three-Phase)
- Demand Metering with selectable time interval
- Drag Hands Operation
- Adjustable Line Overcurrent Tapchange Inhibit
- Voltage Limits
- Tap Position Limits
- Auto Runback (due to overvoltage)
- Auto Runup (due to undervoltage)
- Three independent Voltage Reduction Steps
- Smart Voltage Reduction
- Fast Voltage Recovery
- Sequential and Non-Sequential Operation
- VT Ratio Correction
- Self-Test Alarm Output Contacts
- User Programmable Alarm Contacts
- Tap Position Knowledge by:
  - Contact KeepTrack™
  - Shaft Coupled KeepTrack™
  - Resistor Divider KeepTrack™
  - Motor Direct Drive KeepTrack™
- Operations Counter
- Resettable Operations Counter
- Tap Position Record
- Auto/Off/Manual Switch Status via SCADA
- A or B Regulator Type Selection
- Control Voltage Input
- Motor Power Input
- Source Voltage Input
- Line Current Input
- Raise Output
- Lower Output
- Motor Current Profiling
- Up to 30 unique 15 character User Access Codes (Level 1 or Level 2)
- 20 Character by 2 Row LCD or optional Vacuum Fluorescent Display
- “Hot Buttons” provide quick access to setpoints, configuration and communications
- TCC600 Communications Software
- Adapter Panel Auto/Manual Switch Manual control outside of microprocessor
- Front USB 1.1 Communications Port
- External Inhibit of Auto Tapchange
- Circulating Current Input with Circulating Current, optional ΔVAR® Paralleling Methods including Peer to Peer ΔVAR
- Paralleling, and optional Master/Follower (peer to peer) Paralleling (requires Ethernet)
- Front Panel LEDs for Out-of-Band Raise, Out-of-Band Lower, Reverse Power Flow Rev Pwr Detected, ALARM in effect, Voltage Reduction V/RED in Effect, CPU OK, Auto Operation Block MANUAL, SCADA Control blocked LOCAL and Com1 TX and RX
- Front-Panel Voltage Reduction 1 & 2 Inputs as well as (Binary) inputs (3 Steps Total)
- Neutral Position Detect (Binary) and Counter
- Counter Input (Binary) for Regulator applications/Complete Sequence Input for Transformer applications
- Seal-in/Switch Status Input (Binary)
- Motor Seal-In Block/Alarm
- Non-Sequential/SCADA Block Input (Binary)
- Seal-in Output (Cooper Applications)
- COM1 (top), RS-485 and Fiber Optic Port (ST and V-pin connectors available with 62.5 and 200 micro fiber supported)
- COM2 (top), RS-232 and optional Bluetooth® (user selectable if Bluetooth is installed)
- Communication Protocols include DNP3.0, MODBUS® and IEC 61850 (IEC 61850 only available with optional ethernet port)
- Key Smart Flash SD Card Slot supporting SD and SDHC SD cards
- Smart Flash SD Card can be linked to one or multiple controls providing a physical security “Key” which provides Level 2 User Access to the control when the SD Card is inserted for settings manipulation
- Supports Station and Feeder Level DNP addressing in addition to individual addressing for Smart Grid applications
- One pushbutton access to user configurable Wakeup screen for manual data recording with Smart Flash SD Card saving feature
- Power Quality which consists of:
  - Sequence of Events Recorder (132 events)
  - Data Logging
  - Harmonic Analysis
  - Oscillography
  - CBEMA monitoring to detect sags and swells and trigger data collection and alarming functions
- TapPlot® Oscillograph Data Analysis Software
- Individual Tap Wear Alarm
- Run Through Neutral, Automatic reversing switch swiping
- Remote Voltage Bias

Optional features

- Ethernet Port COM3 (10/100 BaseT) is available through a RJ45 jack or ST Fiber on the top of the control. This port supports DNP over TCP/IP, MODBUS® over TCP/IP, and IEC 61850 over TCP/IP
- Local Wireless Bluetooth capability
- Vacuum Fluorescent Display (rated -40 to +80 degrees Celsius)
- Control Power Back-Up Input – input (+12 Vdc) for backup of Fiber Optic communication loop-through
- IEC 61850 Communications
- ΔVAR® Paralleling:
  - ΔVAR1
  - ΔVAR2
  - ΔVAR2 KeepTrack
  - ΔVAR Peer to Peer
  - Master/Follower Paralleling (peer to peer)

Accessories

- M-2025B(D) Current Loop Interface Module – Current-To-Voltage analog converter for tap position sensors
- M-2026 AC-DC Control Power Backup Supply
- M-2027 Control Power Backup Supply – AC Only
- M-2948 Tap Position Sensor



TCC300 External Connection Locations

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