

Suggested Specification for the INCON 1250-LTC Load Tap Changer Position/Condition Monitor

1. General:

Local and remote LTC position indication and data will be provided by a Synchro style rotary position transmitter and a digital position monitor. The monitor will provide LTC maintenance data, a digital display, relay outputs, and an analog output to interface with operators, field personnel and SCADA.

2. Transmitter:

The synchro transmitter shall use 120VAC (nominal) power for rotor excitation, with its stator windings producing up to 90VAC depending upon angular displacement of the rotor. Mounting configuration shall be: Synchro mounted to a bracket with surge suppression. The transmitter must offer absolute position sensing with no position loss during power interruption. Surge suppression for transient protection must be provided.

3. Indicator:

- 3.1 The monitor will be powered by the same 120 VAC (nominal) power supply as the transmitter. The monitor shall provide an on-board LED local display of tap position. This display shall be programmable for various step configurations used in load tapchangers, including those with single and multiple neutral positions.
- 3.2 The monitor shall be capable of data acquisition relating to the movement of the LTC. This will include as a minimum:
Tap position variation to 0.1 degree resolution, number of tap changes up to or down to each tap, number of consecutive tap changes in one direction, number of days since the last change to highest or to lowest tap and number of days since the LTC passed through neutral.
- 3.3 The monitor shall provide scaled current analog output for SCADA interface. This output can be 0 to +1mA, -1 to +1mA, 0 - 2mA or 4 - 20mA
- 3.4 Output supported by the field software configuration will be provided to produce a stepped analog output.
- 3.5 The monitor shall be equipped with programmable alarming relays that can be used for:
High and low limit, tap change acknowledgment, one direction tap change limits, operation count limit, failure to pass through neutral and to assert an alarm for excessive tap position variation. Simulated "drag hands" will be available to track the highest and lowest positions reached by the LTC.

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- 3.6 The monitor shall be equipped for programming through front panel buttons or through serial RS-232 or RS-485 communication from a computer terminal using ASCII or MODBUS protocols.
 - 3.7 The monitor shall have the ability to report the captured data via serial port.
 - 3.8 The monitor shall have a security lockout to prevent unauthorized programming changes.
4. **Manufacturer and Model Numbers:**
- 4.1 The synchro transmitter shall be an INCON model 1292KS (with bracket and surge protection circuitry).
 - 4.2 The indicator shall be an INCON model 1250-LTC with analog output, relays and a serial option.