

# **mA transducer for Tap Position Indication**

**Type FTPT/2**

## **Description and User Instructions**

<b>Version</b>	<b>Date</b>
V1.0	17-05-2005

**Fundamentals Ltd**

## 1. DESCRIPTION & PRINCIPLE OF OPERATION

The SuperTAPP relay connects to a resistor-chain tap position sender unit for a power transformer as shown in figure 1. The SuperTAPP energises the ends of the resistor chain with 12 VDC, through a 150Ω resistor for short-circuit protection. The SuperTAPP measures the voltage across the resistor chain, and the voltage on the tap position “wiper”, and calculates the tap position from the ratio of the two voltages. The input impedance for the measurements is greater than 1MΩ.

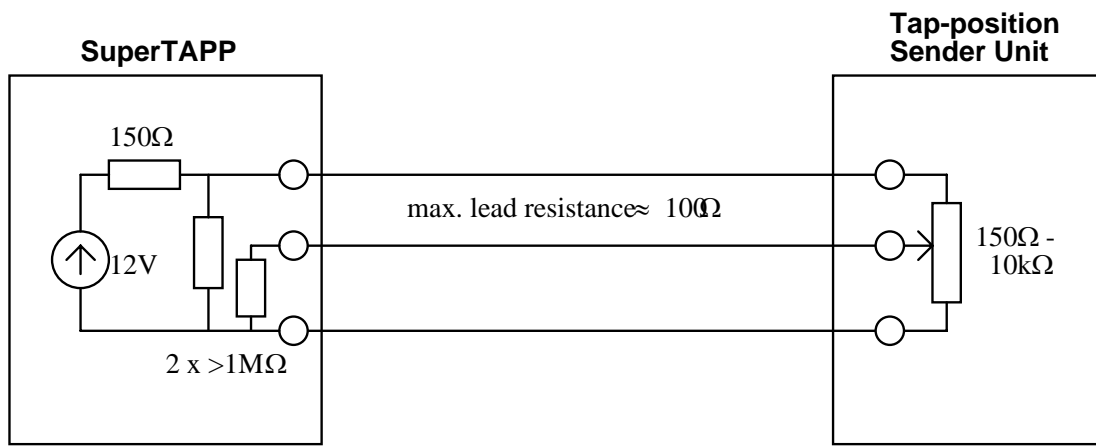


Figure 1. Interface between SuperTAPP and Tap Position Sender Unit

The tap position milli-amp loop transmitter type FTPT/2 attaches to the sender-unit leads in parallel with the SuperTAPP, shown in figure 2. The unit drives a current in a current loop, which increases linearly with the wiper position.

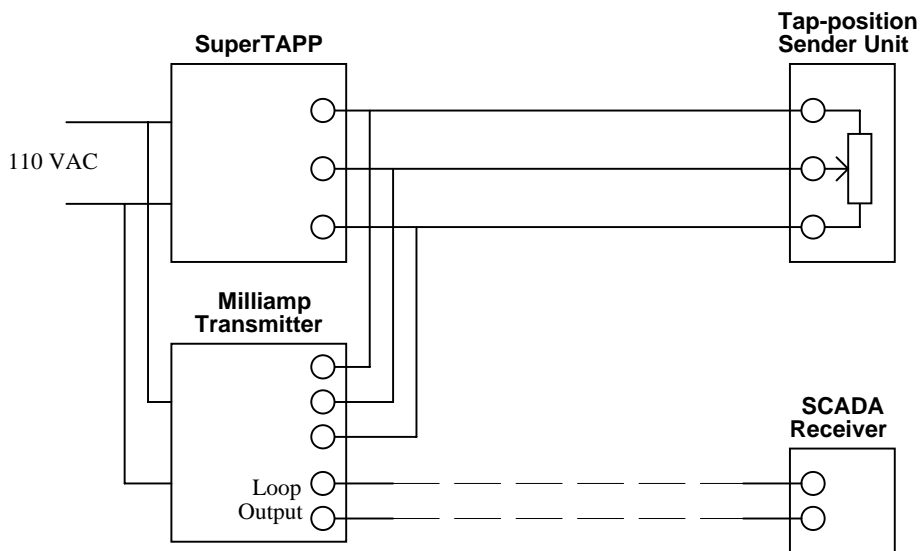


Figure 2. Connection of Milli-amp Transmitter Unit

The unit has 3 ports: a loop “output”, through which it controls a current to signal the tap position, an auxiliary supply input and a resistor chain input.

The milli-amp loop output ranges are 0-10 mA, 0-20 mA and 4-20 mA.

The loop current varies linearly with the resistor chain “wiper position”, to indicate the tap position. The auxiliary supply port provides power for the unit electronics, and to drive the loop output when in active mode.

Each port is isolated from all other ports.

Figure 3 shows the module fascia plate layout. Note that the common for current loop is connected to ‘7’ when used in active mode and ‘12’ when used in passive mode. Also when used in passive mode the current direction must be INTO connection ‘12’.

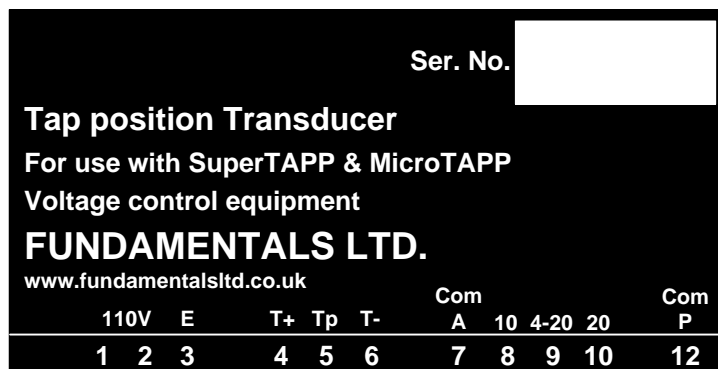


Figure 3

Terminals 4,5 & 6 on the transducer are connected directly to terminals on the RTMU/1 or MicroTAPP relay as shown below: -

Connections on FTPT/1 transducer	Connections on RTMU/1 relay	Connections on MicroTAPP relay
4	27	B23
5	26	B25
6	25	B27

## 2. SPECIFICATION

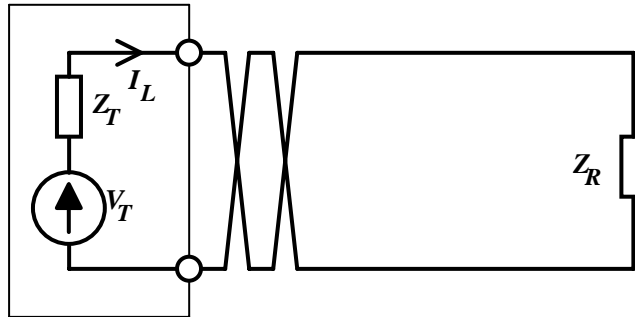
### 2.1. General Characteristics

**Table 2.1 General Characteristics**

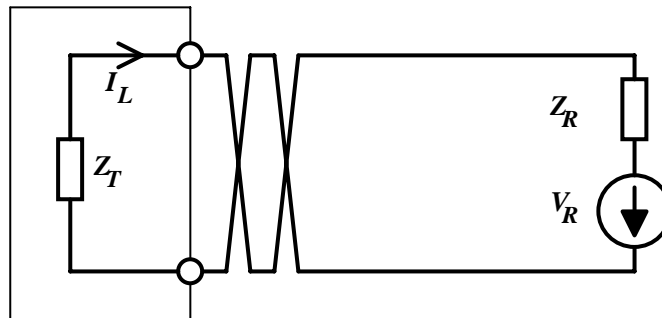
Parameter	Conditions	Min.	Typ.	Max.	Unit
Non-linearity	specified as % of full-scale reading			2	%
Operating temperature		0		50	°C
Isolation between ports	for 1 second	2.0			kV
	for 1 minute	1.0			kV

### 2.2. Loop Output

The loop operates in either active transmit or passive transmit mode as shown in figure 4 and 5.



**Figure 4. Unit in Active Transmit Mode**



**Figure 5. Unit in Passive Transmit Mode**

### Loop Output Characteristics

Parameter	Min.	Typ.	Max.	Unit
Loop current	0		10	mA
	0		20	mA
	4		20	mA
Supply voltage		35		V
	12		36	V
Receiver total input impedance			1	kΩ

### 2.3. Auxiliary Supply Input

#### Auxiliary Input Characteristics

Parameter	Min.	Typ.	Max.	Unit
Supply voltage	80	110	130	V
Unit load		3		VA

### 2.4. Resistor Chain Input

The interface for the resistor chain input is shown in figure 6.

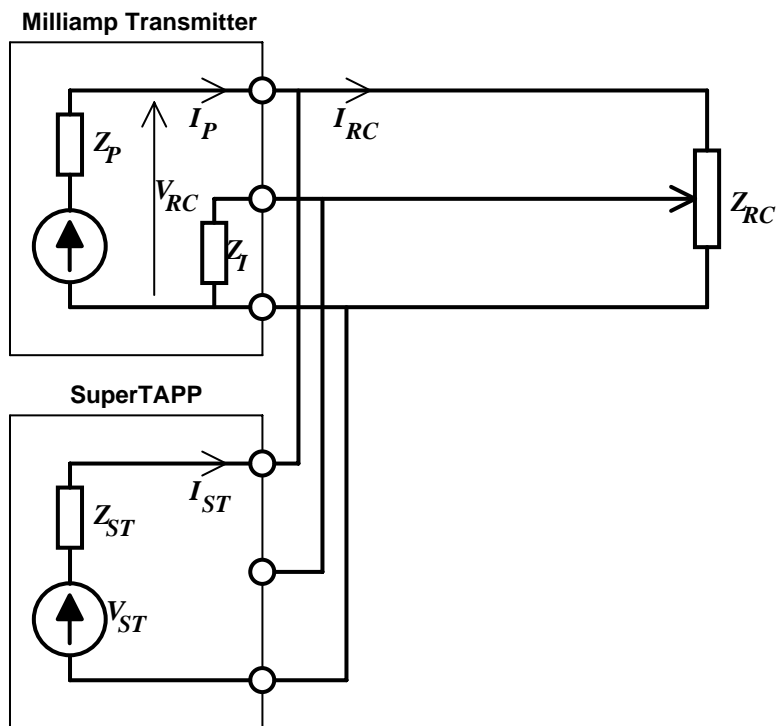


Figure 6. Interaction between Milli-amp Transmitter and SuperTAPP

Table 2.2 Resistor Chain Input Characteristics

Parameter	Min.	Typ.	Max.	Unit
Wiper input impedance	1.0			M $\Omega$
Chain resistance	150		10k	$\Omega$

## 3. INSTALLATION

The FTPT/1 transducer module is constructed on a DIN rail mounting case. The general outline is shown in fig.7.

Screw type terminals are provided for connections to the unit for power supply, tap position indicator and milli-amp outputs.

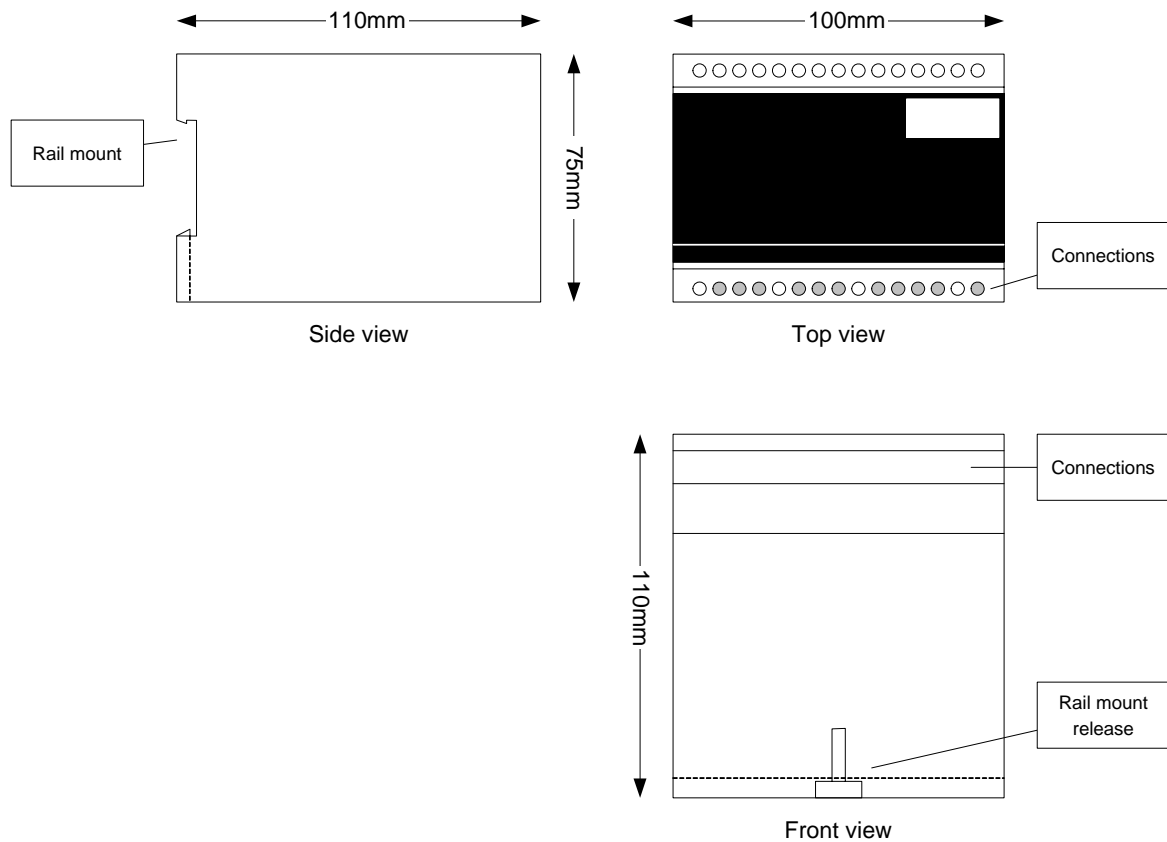


Figure 7

### 3.1. Tap Position Indications

Normally the resistor chain sender unit used for indication of tap position is designed using resistors mounted from position 1 through to the top tap. For example, a 19 position tap changer would have 18 resistors.

When a transducer is used for remote indication it may be required that a zero milliamp from the transducer is read as a false position. In this case an additional resistor equal to a single tap step of the existing resistor chain is added to the bottom and top of the chain as shown in figure 8.

In this case there are now 20 discrete resistor steps (for this 19 tap unit). If a 10mA output is selected the transducer will give 0.5mA for each tap step, if the 20mA output is used the transducer will output 1mA. At the remote end, normally a SCADA system interface, it will be necessary that an appropriate scaling factor is applied to convert the transducer reading to give the tap position indication.

It is also necessary to set the Switch 5 of the Site Conditioning Switch of the RTMU control and monitor relay to the BCD position (down) if this mode of operation is required. When set to BCD the relay will read either the resistor input or the BCD input (if the relay is supplied with BCD input connections).

# Tap Position Transducer

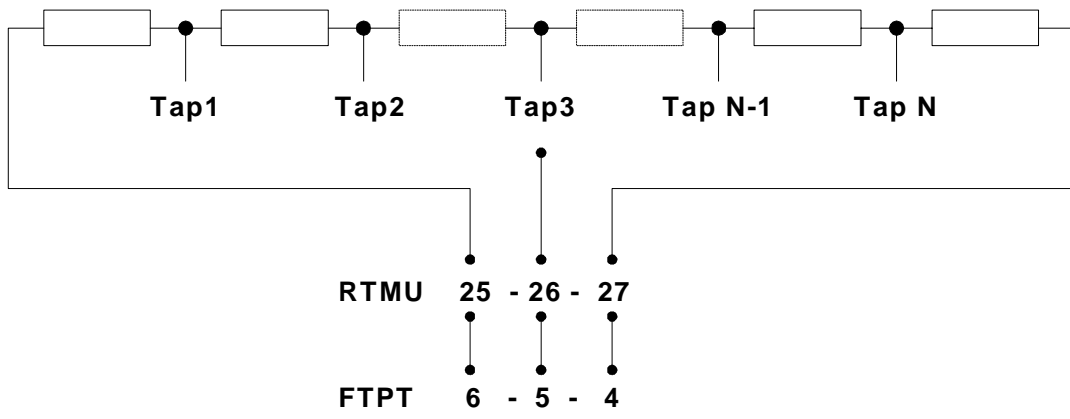


Figure 8