

# 7SG15 MicroTAPP

Automatic Voltage Control

## Document Release History

This document is issue 2010/02. The list of revisions up to and including this issue is:

Pre release

2010/02	Document reformat due to rebrand

## Software Revision History

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[101] MicroTAPP 101 only

[102] MicroTAPP 102 only

'C' indicates setting value is common across all Settings Groups.

## 1 System Config Menu

SETTING		RANGE	DEFAULT
Active Group	C	1 to 8	1
View / Edit Group	C	1 to 8	1
Status Select Grp. Mode	C	Edge Triggered or Level Triggered	Edge Triggered
Relay Identifier	C	Up to 16 alphanumeric characters	MICROTAPP
Set Date	C	DD/MM/YYYY	01/01/1980
Set Time	C	HH:MM:SS	00:00:00
Voltage Display Time	C	15 minutes or 1 hour	1 hour
MPPC Failure Detection	C	Enabled or Disabled	Disabled
Change Password	C	4 alphanumeric characters	NONE
Local / Remote Control	C	Keypad or Status Input	Keypad

## 2 Transformer Menu

SETTING		RANGE	DEFAULT
Transformer Number	C	1 to 16	1
Transformer Capacity (MVA)	C	1 to 10 @ steps of 0.1, 10.5 to 200 @ steps of 0.5, 201 to 2000 @ steps of 1	30.0 MVA
Transformer Impedance (%)	C	5 to 50 @ steps of 0.1	20.0 %
[102] Trfmr. Nominal Primary (kV)	C	0.4 to 40 @ steps 0.1, 41 to 200 @ steps of 1, 205 to 800 @ steps of 5	33.0 kV
Trfmr. Nominal Sec'y (kV)	C	0.4 to 40 @ steps 0.1, 41 to 200 @ steps of 1, 205 to 800 @ steps of 5	11.0 kV
VT Phases	C	3-Phase, AB, BC, CA, AE, BE, CE	3-Phase
VT Ratio (kV : V)	C	0.4 to 40 @ steps 0.1, 41 to 200 @ steps of 1, 205 to 800 @ steps of 5 63.5, 100, 110, 120, 200, 210, 220, 230, 240, 250	11.0 kV : 110 V
CT Phase	C	A, B or C	A
CT Ratio (A)	C	25 to 100 @ steps of 1 105 to 10,000 @ steps of 5 0.5, 1, 2, 5	1500 : 1 A
CT Direction	C	Forward or Reverse	Forward

## 3 TAP-Changer Menu

SETTING		RANGE	DEFAULT
Number of Taps	C	1 to 39	19
Input Type	C	Resistor Chain, Binary, BCD or Gray Code	Resistor Chain
Additional resistor equiv. to	C	0.5 to 2 @ step 0.01, 2.1 to 20 @ step 0.1	1.00 taps
Tap Customisation	C	Enabled or Disabled	Disabled
[101] Lowest Tap	C	Lowest Voltage or Highest Voltage	Lowest Voltage
T/C Runaway Detection		Enabled or Disabled	Enabled
Tap Pulse Length (milliseconds)	C	0 to 1000 @ step of 1, 1010 to 10,000 @ step of 10, 10,100 to 60,000 @ step of 100	1500 ms

Tap-changer Scheme	C	Basic or Step-by-Step	Basic
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### 3.1 Tap Customisation Sub-Menu

SETTING	RANGE	DEFAULT
Physical Tap 0	-99 to 99 plus ‘ ‘ or ‘T’	0
Physical Tap 1	-99 to 99 plus ‘ ‘ or ‘T’	1
...	-99 to 99 plus ‘ ‘ or ‘T’	...
Physical Tap 39	-99 to 99 plus ‘ ‘ or ‘T’	39

NOTE: the available settings in this sub-menu will be dependant upon the “Number of Taps” setting in the Tap-changer Menu.

## 4 Network Config Menu

SETTING	RANGE	DEFAULT
Transformer Group	A to H	A
System Group Capacity (MVA)	1 to 10 @ steps of 0.1, 10.5 to 200 @ steps of 0.5, 201 to 2000 @ steps of 1	30.0 MVA
Power System Rotation	A-B-C or A-C-B	A-B-C
System Power Factor	0 to 0.95 @ steps of 0.01, 0.955 to 1.0 @ steps of 0.005 Lagging or leading	0.970 lagging
Voltage Control Method	TAPP or Circ. Current	TAPP
Frequency Voltage Reduction	Enabled or Disabled	Enabled
Freq. Voltage Redn. Level (Hz)	47 to 62 @ steps of 0.1	48.0 Hz

## 5 Voltage Control Menu

SETTING	RANGE	DEFAULT
Target Voltage (% of nominal voltage)	85 to 115 @ steps of 0.1	100.0 %
Voltage Band (% of nominal voltage)	0.5 to 10.0 @ steps of 0.1	+/- 1.5 %
Load Drop Comp. (% of nominal voltage)	0 to 20 @ step of 0.1	2.5 %
Initial Delay (seconds)	2 to 180 @ steps of 1	120 s
Inter-tap Delay (seconds)	Continuous, 1 to 120 @ steps of 1	10 s
High Volts Char.	DTL or IDMTL	DTL
Fast Tap Down	Enabled or Disabled	Enabled
Tap Stagger Circ. Current (% of System Group Capacity)	-10.0 to +10.0 @ steps of 0.1	0.0 %
Alarm Time (seconds)	0 to 900 @ steps of 10	900 s
Auxiliary Target 1 (% of nominal voltage)	85 to 115 @ step of 0.1	97 %
Auxiliary Target 2 (% of nominal voltage)	85 to 115 @ step of 0.1	94 %
Auxiliary Target 3 (% of nominal voltage)	85 to 115 @ step of 0.1	103 %

## 6 [102] Advanced Control Menu

SETTING		RANGE	DEFAULT
VT / CT Location		LV or HV	LV
Power Trfmr. Type		3-Phase, Single-Phase	3-Phase
Controlled Volt. Pt.		LV or HV	LV
Tap Spacing (% of nominal voltage)	C	0.1 to 5.0 @ steps of 0.01	1.25 %
Nominal Tap Position	C	-39 to +39 @ steps of 1	5
Tr. Volt. Drop Comp.		Enabled or Disabled	Enabled
Lowest Tap		Highest Ratio or Lowest Ratio	Highest Ratio
Tap-Changer Location		LV or HV	HV
V. Target Adjust. Step Size (% of nominal voltage)		0.50 to 2.50 @ steps of 0.05	1.25 %
Volt. Target Ackn. Length (milliseconds)		0 to 1000 @ step of 1, 1010 to 10,000 @ step of 10, 10,100 to 60,000 @ step of 100	1000 ms
Reactive Stability Factor (% of circulating current compensating voltage)		Disabled, 10 to 95 @ steps of 5	Disabled

## 7 Voltage Control Menu

SETTING		RANGE	DEFAULT
Overvoltage Alarm Level (% of nominal voltage)		85 to 135 @ steps of 1	105 %
Undervoltage Alarm Level (% of nominal voltage)		75 to 125 @ steps of 1	95 %
Overload Blocking Level (% of Transformer Capacity)		80 to 200 @ steps of 5	100 %

## 8 Output Config Menu

SETTING		RANGE	DEFAULT
Relay Healthy	C	RL 1 to RL 5 (to RL 13)	NONE
Tap Raise	C	RL 1 to RL 5 (to RL 13)	RL 5
Tap Lower	C	RL 1 to RL 5 (to RL 13)	RL 4
Tap-changer Runaway *	C	RL 1 to RL 5 (to RL 13)	RL 2
Operation Permitted	C	RL 1 to RL 5 (to RL 13)	NONE
Volt Control Alarm	C	RL 1 to RL 5 (to RL 13)	NONE
U/V O/V Alarm	C	RL 1 to RL 5 (to RL 13)	RL 3
Overload Alarm	C	RL 1 to RL 5 (to RL 13)	RL 3
Control in Auto	C	RL 1 to RL 5 (to RL 13)	NONE
Control in Local	C	RL 1 to RL 5 (to RL 13)	NONE
Ready for Switch-out	C	RL 1 to RL 5 (to RL 13)	RL 1
Tap Incomplete *	C	RL 1 to RL 5 (to RL 13)	RL 2
Tap Count Alarm	C	RL 1 to RL 5 (to RL 13)	NONE
Sum of I <sup>2</sup> Alarm	C	RL 1 to RL 5 (to RL 13)	NONE
Block Raise Command	C	RL 1 to RL 5 (to RL 13)	NONE
Block Lower Command	C	RL 1 to RL 5 (to RL 13)	NONE
VT Fuse Blown	C	RL 1 to RL 5 (to RL 13)	NONE
Tap-change Reset	C	RL 1 to RL 5 (to RL 13)	NONE
[102] Dead Reckoning Block	C	RL 1 to RL 5 (to RL 13)	NONE
MPPC Failure	C	RL 1 to RL 5 (to RL 13)	NONE
End of Tap Range	C	RL 1 to RL 5 (to RL 13)	NONE
Tap not achievable	C	RL 1 to RL 5 (to RL 13)	NONE
[102] Volt. Target Ackn.	C	RL 1 to RL 5 (to RL 13)	NONE
Group 1 Selected	C	RL 1 to RL 5 (to RL 13)	NONE
Group 2 Selected	C	RL 1 to RL 5 (to RL 13)	NONE
Group 3 Selected	C	RL 1 to RL 5 (to RL 13)	NONE
Group 4 Selected	C	RL 1 to RL 5 (to RL 13)	NONE
Group 5 Selected	C	RL 1 to RL 5 (to RL 13)	NONE
Group 6 Selected	C	RL 1 to RL 5 (to RL 13)	NONE
Group 7 Selected	C	RL 1 to RL 5 (to RL 13)	NONE
Group 8 Selected	C	RL 1 to RL 5 (to RL 13)	NONE

NOTE: the available settings in this Menu will be dependant upon the number of hardware output relays fitted.

\* These operations also result in a Lockout.

## 9 Status Config Menu

SETTING		RANGE	DEFAULT
Inverted Inputs	C	S1 to S11 (to S19)	NONE
MicroTAPP Enable	C	S1 to S11 (to S19)	SI 1
Raise from T/C	C	S1 to S11 (to S19)	SI 2
Lower from T/C	C	S1 to S11 (to S19)	SI 3
Tap in Progress	C	S1 to S11 (to S19)	SI 7
Tap Raise Block	C	S1 to S11 (to S19)	NONE
Tap Lower Block	C	S1 to S11 (to S19)	NONE
Prepare Switch-out	C	S1 to S11 (to S19)	SI 6
Tap Stagger	C	S1 to S11 (to S19)	NONE
Remote Raise *	C	S1 to S11 (to S19)	SI 10
Remote Lower *	C	S1 to S11 (to S19)	SI 11
Remote Auto *	C	S1 to S11 (to S19)	SI 8
Remote Manual *	C	S1 to S11 (to S19)	SI 9
Select Aux Target 1	C	S1 to S11 (to S19)	SI 4
Select Aux Target 2	C	S1 to S11 (to S19)	SI 5
Select Aux Target 3	C	S1 to S11 (to S19)	NONE
Local / Remote	C	S1 to S11 (to S19)	NONE
[102] Volt. Target Incr. *	C	S1 to S11 (to S19)	NONE
[102] Volt. Target Decr. *	C	S1 to S11 (to S19)	NONE
[102] Volt. Target Reset *	C	S1 to S11 (to S19)	NONE
Select Group 1 **	C	S1 to S11 (to S19)	NONE
Select Group 2 **	C	S1 to S11 (to S19)	NONE
Select Group 3 **	C	S1 to S11 (to S19)	NONE
Select Group 4 **	C	S1 to S11 (to S19)	NONE
Select Group 5 **	C	S1 to S11 (to S19)	NONE
Select Group 6 **	C	S1 to S11 (to S19)	NONE
Select Group 7 **	C	S1 to S11 (to S19)	NONE
Select Group 8 **	C	S1 to S11 (to S19)	NONE

NOTE: the available settings in this Menu will be dependant upon the number of hardware status inputs fitted.

\* These inputs are positive edge triggered. All other inputs are level dependant.

\*\* These operations may be configured as edge or level triggered.

## 10 Communications Menu

SETTING		RANGE	DEFAULT
Station Address	C	0 to 254	0
IEC60870 on port	C	COM 1 or COM 2	COM 1
COM 1 Baud Rate	C	110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	19200
COM 1 Parity	C	NONE, ODD or EVEN	EVEN
COM 1 Line Idle	C	LIGHT OFF or LIGHT ON	LIGHT OFF
COM 1 Data Echo	C	OFF or ON	OFF
COM 2 Baud Rate	C	110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	19200
COM 2 Parity	C	NONE, ODD or EVEN	EVEN
COM 2 Line Idle	C	LIGHT OFF or LIGHT ON	LIGHT OFF
COM 2 Data Echo	C	OFF or ON	OFF
COM 2 Direction	C	AUTO-DETECT, FRONT PORT or REAR PORT	AUTO-DETECT
IEC60870 class 2 Refresh (seconds)	C	0 to 60 @ step of 1 70 to 600 @ step of 10	60 s
IEC60870 class 2 Window (% of nominal)	C	OFF, 1 to 20 @ step of 1	OFF

## 11 Data Storage Menu

SETTING		RANGE	DEFAULT
Clear all Events		NO or YES	NO
Clear all Faults		NO or YES	NO

## 12 TAP-Changer Maint. Menu

SETTING		RANGE	DEFAULT
Delta Count Alarm	C	OFF, 100 to 10,000 @ step of 10	500
Sum of I Squared Alarm (MA <sup>2</sup> )	C	OFF, 10 to 1000 @ step of 10, 2000 to 99,000 @ step of 1000	9000 MA <sup>2</sup>
Clear Delta Tap Change Count		NO or YES	NO
Clear Delta Sum of I <sup>2</sup> Count		NO or YES	NO