TeSys® model U

User's manual

LUCM••BL and LUCMT1BL

Multifunction Control Unit,

05-2004

une marque de
Schneider
Electric

Telemecanique

⚠ WARNING

HARZARDOUS OPERATION

This device must be installed, set-up and serviced only by qualified personnel,

User must follow all applicable codes, standards and regulations,

Do not alter or modify this equipment,

Failure to follow these instructions can result in death, serious injury, or equipment damage.

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Chapter 1 - General information

1-1 Introduction

The **LUCM••BL** Multifunction Control Units provide control, protection and monitoring capabilities for the following TeSys® model U Products:

- **LU•B••** Self protected combination starters,
- **LU•S••** Starters,
- **LUTM••BL** Overload relay/controller.

It requires a control circuit supply of 24 V DC.

The functions provided are typical to those for other multifunction relays that protect single and three-phase electric motors.

NOTE: *The **LUCM••BL** Multifunction Control Units are for use with AC motor loads only.*
*The **LUCMT1BL** Multifunction Control Units are for use with 3 Phase AC motor loads only.*

1-1-1 Protection functions

- Overcurrent protection,
- Overload protection (selection of trip class 5 to class 30),
- Ground fault detections,
- Protection against phase imbalance,
- Protection against mechanical blockages during or after the starting phase,
- Protection against under load conditions,
- Starter tripped by an external signal (option).

NOTE: *The **LUCMT1BL** does not provide overcurrent protection.*

1-1-2 Alarm functions

The Multifunction Control Units include alarm functions.

The alarm thresholds are configurable and independent of the associated protection function thresholds.

1-1-3 Diagnostic functions

The Multifunction Control Units record and display:

- number of operating hours for the motor,
- total number of starts,
- total number trips,
- reason for trip.

For the last five trips, the Multifunction Control Units record the state of the Power Base at the time of the trip (current values, thermal state and trip type).

1-1-4 Configuration and Monitoring

The Protection, Alarm and Diagnostic Functions can be configured or monitored:

- locally via: the integrated display and keypad,
- remotely via:
  - IBM compatible personal computer (utilizing PC "PowerSuite™ software" VW3A8104),
  - Pocket PC (utilizing Pocket PC "PowerSuite™ software" VW3A8102),
  - Programmable Logic Controller communication bus,
  - Door mounted dialog terminal XBT NU 400.

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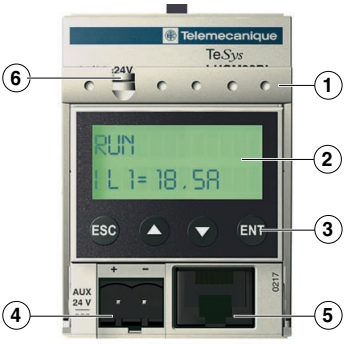
1-2 Presentation

1-2-1 Multifunction Control Unit



1) Locking and extraction handle,

2) Built-in LCD screen (2 lines/12 characters),

3) 4-button keypad,

4) Auxiliary control power input 24 V DC,

NOTE: *The **LUCMT1BL** does not provide access to this input as it is provided for on the **LUTM••BL** base.*

5) RJ-45 external communication port, RS 485,

6) Sealing option to prevent removal from the Power Base.

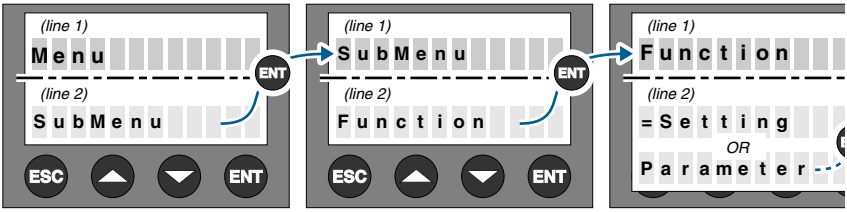
The built-in keypad and display can enable:

- in **Configuration and settings** *(page 21)*, local configuration of alarm and protection functions,
- in **"Run" mode (settings)** *(page 23)*, selected real time motor load values.

The external RS 485 serial communication port on the front panel can be used to connect to:

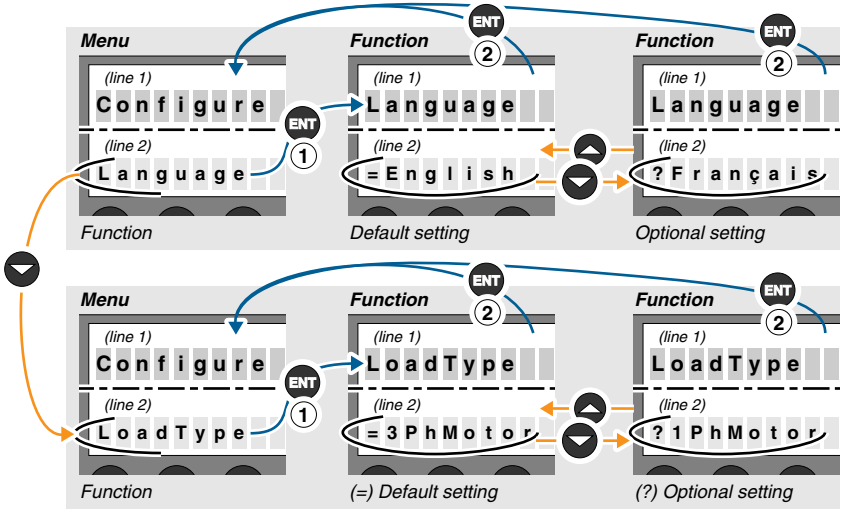
- an IBM compatible personal computer,
- a Pocket PC,
- a Programmable Logic Controller.
- door mounted dialog terminal XBT NU 400.

1-2-2 Keypad / programming principles



- The Multifunction Control Unit includes a two line display which allows the user to step up/ step down in the Submenu, Function and Setting levels with the four button keypad.

ESC	• Steps up to the previous level in the menu structure. ***NOTE:*** *The* **ESC** *key* ***does not save a setting****.* *Successive key strokes may be required to return to the main menu.*
▲ ▼	• Scrolls through the various possibilities - within a menu ==> the various submenus, - within a submenu ==> The various functions, - within a function ==> the various settings. ***NOTE:*** *Some menu levels only include functions and settings. Others have functions that can consist of several parameters with different settings.* • Scrolls through the function settings available. ***NOTE:*** *Default or stored function setting values are indicated by "=" and available values are indicated by "?".* *Holding down the relevant key will accelerate the incrementing / decrementing of a value.*
ENT	**1)** Steps down one level in the menu structure, **2)** Saves and stores the function settings shown in the display. ***NOTE:*** *Once (a function setting) has been saved (with the* ***ENT*** *key):* *- the "?" sign will be replaced by the "=" sign,* *- the setting remains visible for 2 seconds then automatically steps up one level in the menu structure.*



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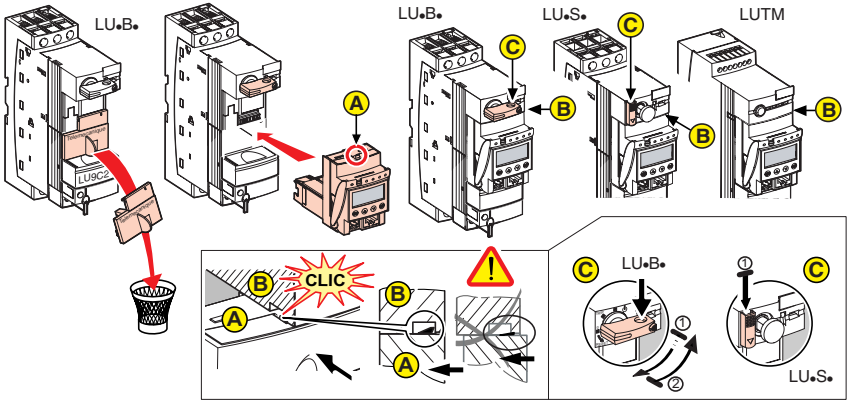
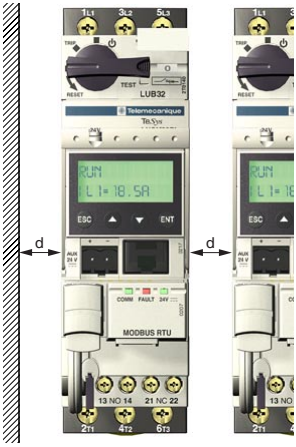
1-3 Technical data

1-3-1 Installation



NOTE: *When installed in the Power Base, the Multifunction Control Unit secures the options modules. The Multifunction Control Unit must be removed for installation or removal of the option modules.*

1-3-2 Operating temperatures



LU•B•• and LU•S••	
d = 0 mm (0 in)	45° C (113° F)
d ≥ 9 mm (0.35 in)	55° C (131° F)
d ≥ 20 mm (0.75 in)	60° C (140° F)
LUTM••BL	
d = 0 mm (0 in)	65° C (149° F)

NOTE: *The Multifunction Control Units can be operated at +5° C (9° F) for AC motor loads less than 12.0 full load Amps on Power Bases **LU•B••** and **LU•S••** only,*

The Multifunction Control Unit has internal temperature watchdog functions that can not be disabled.

*An "**Warn-IntTmp**" warning will be displayed if the internal temperature reaches 80°C.*

*The Motor starter will trip and the control unit will display "**Int Trip**" if the internal temperature reaches 90°C.*
The internal temperature may be monitored via the RS485 port :
- locally using the PowerSuite™ software,
- remotely using the Modbus® bus.

*(see **"Fault" mode (diagnostics)** (page 25) for reseting of an "**Int Trip**" fault).*

1-3-3 Control connections

1-3-3-1 LUCM••BL

The **LUCM••BL** Multifunction Control Unit has two 24V DC power inputs. The **coil control input**, accessible only by the A1, A2 terminals on the Power Base, and the **auxiliary power input** on the face of the Multifunction Control Unit. The **auxiliary power input** is only required for the following functions.

- Initial configuration and setting before installation into a Power Base:
- Initial configuration and setting before supplying coil control power to the A1, A2 terminals,
- Operation of remote and auto-reset functions with 3-wire control,
- Modification of settings in the "**Off**" *(see 2-2, p. 21)*, "**Trip**" or "**Fault**" modes *(see 2-3-4, p. 26)*,
- Display of fault type or statistics in the "**Trip**" and "**Off**" modes *(see 2-3-4, p. 26)*,
- Communicating with the Multifunction Control Unit in the "**Trip**" and "**Off**" modes *(see 2-3-4)*,
- Operation of certain optional communication and function modules.

NOTE: *Cycling coil control power to the A1, A2 terminals without auxiliary control power will reset all **Off-Fault**s functions allowing the main contacts to close (see 2-3-4, **Warnings and Faults (diagnostics)**, page 26).*

The coil control input A2 is internally connected to the auxiliary power input (-) terminal.
*If the polarity of the A1, A2 terminals has been reversed, the Multifunction Control Unit will trip on an "**Int Trip**" 62 fault (see **"Fault" mode (diagnostics)** (page 25) for reseting of an "**Int Trip**" fault).*

1-3-3-2 LUCMT1BL

The **LUCMT1BL** Multifunction Control Unit has only one 24V DC control power input accessible only by the +/- terminals on the **LUTM••BL** Power Base. The control power input is required for configuration and operation.

NOTE: *Cycling control power will reset all **Off-Fault**s (see 2-3-4, **Warnings and Faults (diagnostics)**, page 26).*

⚠ WARNING

Loss of shutdown protection

- Components that disconnect power, such as E-stop or limit switches, must be connected with the coil control positive (+) terminal A1.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

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1-3-4 Minimum required setup

See **Config Menu (Configuration Menu)** Warnings *(pages 28 and 29)*.

The Multifunction Control Unit can be set up quickly by performing the minimum operations below:

- (**LUCM••BL**) Supply power to the auxiliary power input (24V DC),
  or
- (**LUCMT1BL**) Power the Overload relay/controller **LUTM••BL** (24V DC)
- Program the Multifunction Control Unit as follows:

1) Enter the **Config Menu (Configuration Menu)** *(page 27)* by pressing the **ENT** key. Validate the functions that define the Multifunction Control Unit profile and then enable the **End Config** *(page 34)* function to enter the **Main Menu** *(page 35)* or "**Pause**" mode (see ***33_PauseMtr*** *(page 43)* for disabling "**Pause**" mode),

2) In the **Main Menu**, scroll past **1_Reference** *(page 35)* and **2_Display** *(page 35)* and enter into the **3_Setup** *(page 35)* submenu,

3) In the **3_Setup** submenu, enter into the **31_FLASet** *(page 41)* parameter. Scroll through and validate the desired full load motor current value.

NOTE: *All the other functions and parameters are set to their default values (see 1-3-5, **Default settings and optional values**, page 13).*

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1-3-5 Default settings and optional values

Menu	Submenu	Function	Parameter	Default Setting or Reference	Optional values
Config Menu		Language..... *(for LUCM••BL only)		= English	? Français ? Español* ? Deutsch* ? Italiano*
		LoadType (for LUCM••BL only) ...		= 3 PhMotor	? 1 PhMotor
		Base (for LUCM••BL only).....		= SelfProtStr	? Starter
		AuxFan		= No	? Yes
		CT_Ratio (for LUCMT1BL only) (no default, must be set)	? 30:3	= No	? Yes (3.5 - 10.5 A)
			? 30:2	= No	? Yes (5.2 - 15.7 A)
			? 30:1	= No	? Yes (10.5 - 31.5 A)
			? 50:1	= No	? Yes (17.5 - 52.5 A)
			? 100:1	= No	? Yes (35 - 105 A)
			? 200:1	= No	? Yes (70 - 210 A)
			? 400:1	= No	? Yes (140 - 420 A)
			? 800:1	= No	? Yes (280 - 840 A)
			? Others	Parameter Submenu	
				Primary Secondary Exter_Pass	1 to 65535 1 to 65000 1 to 65000
		End Config.....		= No	? Yes
Main Menu	1_Reference	11_Catalog		LUCMx6BL *(see 31_FLASet)*	Determined by Multifunction Control Unit (reference)
		12_Firmware.....		Rev: xx.xx	
		13_FLA Range		0.15 A to 0.6 A (Min to Max) *(see 31_FLASet)*	
		14_LoadType.....		= 3 PhMotor	(read only) Set in **Config Menu** *(page 27)*
		15_AuxFan		= No	
		16_PowerBase		= SelfProtStr	
	2_Display	21_AvCurrent		= Yes	? No
		22_ThermCap.....		= No	? Yes
		23_L1Current		= No	? Yes
		24_L2Current		= No	? Yes
		25_L3Current		= No	? Yes
		26_GFCurrent		= No	? Yes
		27_LastTrip.....		= No	? Yes
		28_PhaseImb		= No	? Yes
		29_ONhours		= No	? Yes

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Menu	Submenu	Function	Parameter	Default Setting or Reference	Optional values
(Main Menu)	3_Setup	31_FLASet *(for LUCM••BL only) Determined by Multifunction Control Unit (reference) (1 among the 6)	*LUCMx6BL	= 0.15 A	? 0.15 to 0.6
			*LUCM1xBL	= 0.35 A	? 0.35 to 1.4
			*LUCM05BL	= 1.25 A	? 1.25 to 5
			*LUCM12BL	= 3 A	? 3 to 12
			*LUCM18BL	= 4.5 A	? 4.5 to 18
			*LUCM32BL	= 8 A	? 8 to 32
		(for LUCMT1BL only)	LUCMT1BL	= 0.35 A (% CT_Ratio)	? 0.35 to 1.05 (% CT_Ratio)
		32_TestTrip		= No	? Yes
		33_PauseMtr		= No	? Yes
		34_Language..... *(for LUCM••BL only)		= English	? Français ? Español* ? Deutsch* ? Italiano*
		35_PauseMode		= Yes	? No
	4_AdvSetup	41_TripClass		= 5	? 5 to 30
		42_ResetMode		= Manual	? Remote/Ent ? Auto
		43_RstAdjust	ResetTime	= 120 Sec.	? 1 to 1000
			ResetLevel	= 80% (Capacity)	? 35 to 95
		44_MagTrip (for LUCM••BL only)		= 1420% FLA	? 300 to 1700
		45_OLWarning	Warning	= On	? Off
			Warn Level	= 85% (Capacity)	? 10 to 100
		46_GroundFlt	Trip	= On	? Off
			TripTime	= 1.0 Sec.	? 0.1 to 1.2
			TripLevel	= x A (30% FLA min)	? 20 to 500
			Warning	= On	? Off
			Warn Level	= x A (30% FLA min)	? 20 to 500
		47_PhaseImb	Trip	= On	? Off
			TripTimeStrt	= 0.7 Sec.	? 0.2 to 20
			TripTimeRun	= 5.0 Sec.	? 0.2 to 20
			TripLevel	= 10% IMB	? 10 to 30
			Warning	= On	? Off
			Warn Level	= 10% IMB	? 10 to 30

Menu	Submenu	Function	Parameter	Default Setting or Reference	Optional values
(Main Menu)	(4_AdvSetup)	48_Jam	Trip	= Off	? On
			TripTime	= 5 Sec.	? 1 to 30
			TripLevel	= 200% FLA	? 100 to 800
			Warning	= Off	? On
			Warn Level	= 200% FLA	? 100 to 800
		49_UnderLoad	Trip	= Off	? On
			TripTime	= 10 Sec.	? 1 to 200
			TripLevel	= 50% FLA	? 30 to 100
			Warning	= Off	? On
			Warn Level	= 50% FLA	? 30 to 100
		410_LongStrt	Trip	= Off	? On
			TripTime	= 10 Sec.	? 1 to 200
			TripLevel	= 100% FLA	? 100 to 800
			Warning	= Off	? On
			Warn Level	= 100% FLA	? 100 to 800
	5_CommSetup	51_Drop		= 1	? 1 to 247
		52_Baud		= 19200 bps	? 1200 to 19200
		53_Parity		= None	? Even
		54_Control		= On	? Off
		55_CommLoss		= Ignore	? Dropout ? Trip ? Warning
	6_Module	61_ID Clear		= Yes	= No
		62_Reference	Module	ID = 0	
			Catalog	? (if ID = 0)	
			Firmware	Rev: 0.00 (if ID = 0)	
		63_Id Set		= 0	0 to 149
		64_Param dec	Parameter 1-16	= 00000	00000 to 65535
		65_Param hex	Parameter 1-16	= 0000	0000 to FFFF
	7_Statistics	71_Trip0		Statistics data is cleared by default *(see **7_Statistics**, page 73)*	
		72_Trip1			
		73_Trip2			
		74_Trip3			
		75_Trip4			
		76_Totals			

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Menu	Submenu	Function	Parameter	Default Setting or Reference	Optional values
(Main Menu)	8_Password	81_Unlock		Passwd?	0000 - 9999
		82_Lock		NewPSW?	0000 - 9999
		83_Rst Stats		= No	? Yes
		84_RstToDfts.....		= No	? Yes

1-3-6 Specifications

1-3-6-1 Environment

Conforming to standards	IEC 947-4-1, IEC 34-11, IEC 755, VDE 0106, VDE 0660			
European community directives	CE marking. Meets the essential requirements of low Voltage equipment (LV) & Electromagnetic Compatibility (EMC)			
Approvals			UL 508, CSA, PTB	
Protective treatment			"TH" (Tropical Finish)	
Degree of protection	Conforming to IEC 947-1		IP 20([1])	
Pollution degree	Conforming to IEC 664		3	
Shock resistance	Conforming to IEC 68-2-27		10g open, 15g closed, 11 milliseconds	
Vibration resistance	Conforming to IEC 68-2-6		2g open, 4g closed, 5 to 150 Hz	
Ambient air temperature around the device	Storage	**°C** **°F**	- 35 to + 85 - 31 to + 185	
	Operation	**°C** -20 to +60 **°F** -4 to +140	*(see 1-3-2, **Operating temperatures**, page 10 for derating considerations)*	
Flame resistance	Conforming to UL 94		V2	
Maximum operating altitude		**m** **ft**	2000 6562	
Operating position	In relation to normal vertical mounting plane		Horizontal or vertical 30° angle front or back	
Electromagnetic compatibility Electrostatic discharge	Conforming to IEC 1000-4-2 level 3	**kV**	8	
Electromagnetic compatibility Electromagnetic field	Conforming to IEC 1000-4-3 level 3	**V/m**	10	
Electromagnetic compatibility Fast transient burst	Conforming to IEC 1000-4-4 level 4	**kV**	4	
Electromagnetic compatibility Surge immunity	Conforming to IEC 1000-4-5		Common mode	Serial mode
	Level 4 (Power circuit)	**kV**	6	4
	Level 1 (Control circuit)	**kV**	1	0.5
	Level 2 (Communication circuit)	**kV**	1	1
Electromagnetic compatibility Conducted disturbances	Conforming to IEC 1000-4-6 level 3	**V**	3([2]) 10([3])	
Rated undissipated pulse withstand (U imp)	Conforming to IEC 947-1	**kV**	2	
Resistance to low frequency disturbances - supply harmonics	Conforming to IEC 947-2 Appendix F Clause F4.1			
Resistance to micro-breaks	Conforming to IEC 1000-4-11			

(1) Only applicable when power cabling to Power Base exceeds the following sizes: 1,5 mm² (16 AWG) fitted with cable end or 2.5 mm² (14 AWG) not fitted with cable end.

*(2) Conforms to IEC 1000-4-6 when **46_GroundFlt** + **TripLevel** is set < 50% FLA minimum.*

*(3) Conforms to IEC 1000-4-6 when **46_GroundFlt** + **TripLevel** is set > 50% FLA minimum*

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1-3-6-2 Power circuit

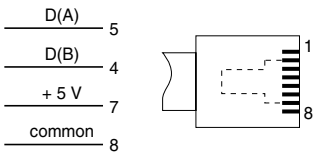
Operating voltage range		**V**	110 to 690 VAC
Rated insulation voltage (Ui)	Conforming to IEC 947-1	**V**	690 VAC
Operating frequency(4)		**Hz**	47-63
Rated operational current		**A**	
LUCMx6BL	.....		0.15 to 0.6
LUCM1xBL	.....		0.35 to 1.4
LUCM05BL	.....		1.25 to 5
LUCM12BL	.....		3 to 12
LUCM18BL	.....		4.5 to 18
LUCM32BL	.....		8 to 32

(4) For use with 110 to 690 V, 50/60 Hz AC motors only. Not approved for use with DC motors.
- Approved for use upstream of variable frequency drives.
- Not approved for use downstream of variable frequency drives

1-3-6-3 Control circuit supply (A1, A2 terminals and auxiliary power input)

Operating voltage		**V**	20.4 to 31.2 VDC
Rated insulation voltage (Ui)	Conforming to IEC 947-1	**V**	380 VAC
Cabling (aux. power only)			
- Solid or stranded cable.....	1 conductor	**mm²** **AWG**	0.5 to 1 20 to 18
- Stranded cable with cable end.....	1 conductor	**mm²** **AWG**	0.5 to 1 20 to 18
- Solid cable.....	2 conductors	**mm²** **AWG**	0.2 to 1 24 to 18
- Stranded cable.....	2 conductors	**mm²** **AWG**	0.2 to 1.5 20 to 18
Terminal tightening torque (aux. power only)		**N.m** **lb-in**	0.5 to 0.6 4.6 to 5.6

1-3-6-4 RS 485 Serial port RJ-45 connector

Electrical Interface	RS 485	
Connector	RJ-45	
RJ-45 pin-out	(cable connector top view)  	
Isolation	**V**	1 kV
Max. line length	**m (ft)**	1000 m (3280 ft)
max. tap-off length	**m (ft)**	20 m (65 ft)
Parity	None - 1 start bit, 8 data bits and 1 stop bit (10 bits total Default)	
	Even - 1 start bit, 8 data bits, even parity and 1 stop bit (11 bits total)	
Modbus® RTU commands	The Multifunction Control Units shall support the following Modbus® RTU **commands**: - Code 3 (03 hex) - Normal read holding registers (maximum 100 registers) - Code 6 (06 hex) - Preset (write) single register - Code 16 (10 hex) - Preset (write) multiple registers (maximum count = 46) - Code 65 (41 hex) - Private identification request (specific for drives)	
	The Multifunction Control Units shall support the following Modbus® RTU **reponses**: - Code 3 (03 hex) - Normal read holding registers reponse - Code 6 (06 hex) - Normal preset (write) single register reponse - Code 16 (10 hex) - Normal preset (write) multiple registers reponse - Code 65 (41 hex) - Private identification reponse (data specific for drives: { 0x01, '-', 0x01, '-', 'B', '2', 'B', '2', 'B', '2', 'B', '2', 'B', '2', 'X', 'w', 0x28, 0x01, 0x00})	
	The Multifunction Control Units shall support the following Modbus® RTU **codes**: - Code 01 - Illegal function - Code 02 - Illegal data address - Code 03 - Illegal data value (write command not completed)	
	The **54_Control (Write Control)** *(page 67)* enable feature can be used to enable (On) or disable (Off) write privilege to the Multifunction Control Units configuration registers. If **54_Control (Write Control)** *(page 67)* is (No), write commands are restricted to the following list of " **- always enabled -** " registers: - Remote keypad (register 1100) - Multifunction Control Units state control (register 704) - Multifunction Control Units extended state control (register 705) - Option module configuration (registers 680-690) - Private registers above 20000	

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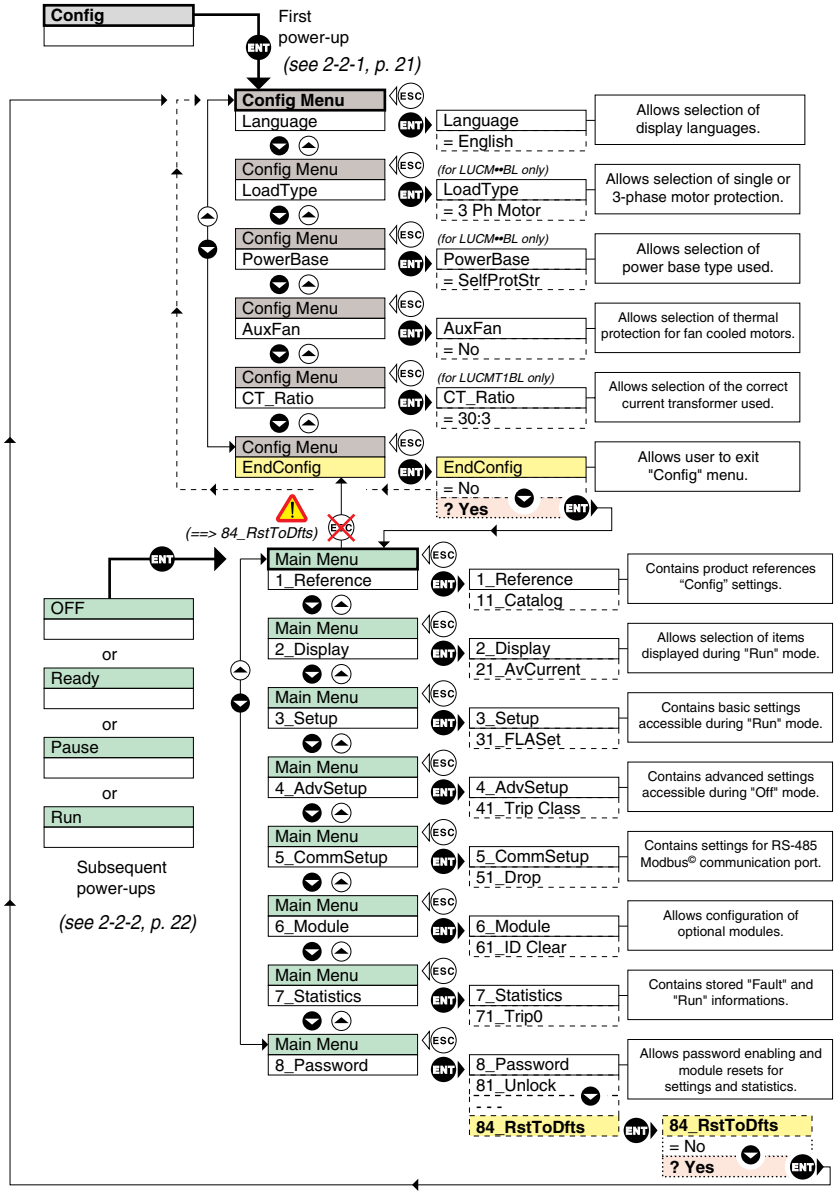
Chapter 2 - Operation

2-1 Menu structure

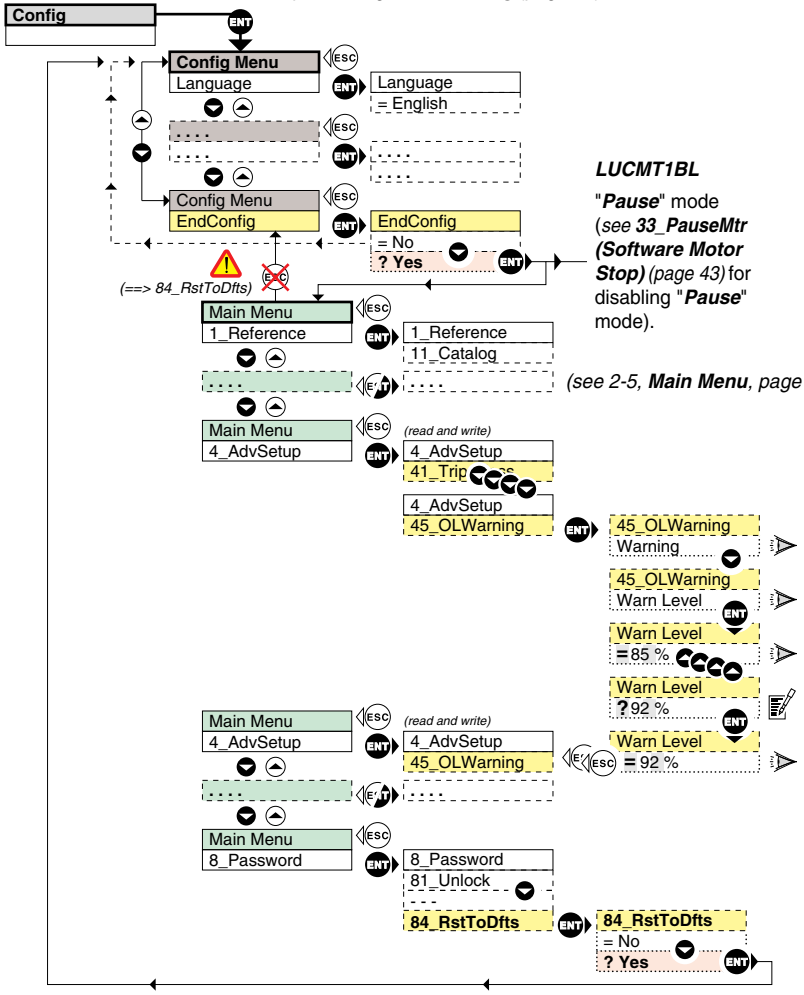
- **Config Menu (Configuration Menu)** *(page 27)* contains equipment specific settings not considered adjustable after initial configuration.
- **Main Menu** *(page 35)* contains application specific settings and parameters considered adjustable.



2-2 Configuration and settings

2-2-1 "Config" mode (first power-up: configuration and settings)

- The Multifunction Control Unit must be configured before it will allow the power contacts to be closed.
- Configuration can be made on the **LUCM••BL** by suppling 24V DC to either the auxiliary control terminals or to coil control A1, A2 terminals on the **LU•B••** and **LU•S••** Power Base,
- Configuration can be made on the **LUCMT1BL** by suppling 24V DC to the +/- control power input on the **LUTM••BL** Power Base,
- The **LUCMT1BL** and, when using only coil control power to the **LUTM••BL** Power Base A1, A2 terminals the Multifunction Control Unit goes into the "**Pause**" mode when **End Config** *(page 27)* is validated. The power contacts can be closed by disabling the **33_PauseMtr** *(page 41)* function *(see warning, **33_PauseMtr (Software Motor Stop)**, page 43)*.
- The **LUCMT1BL** Multifunction Control Unit has no default setting for the CT_Ratio configuration. The CT_Ratio must be set before proceeding to **End Config** *(page 27)*.



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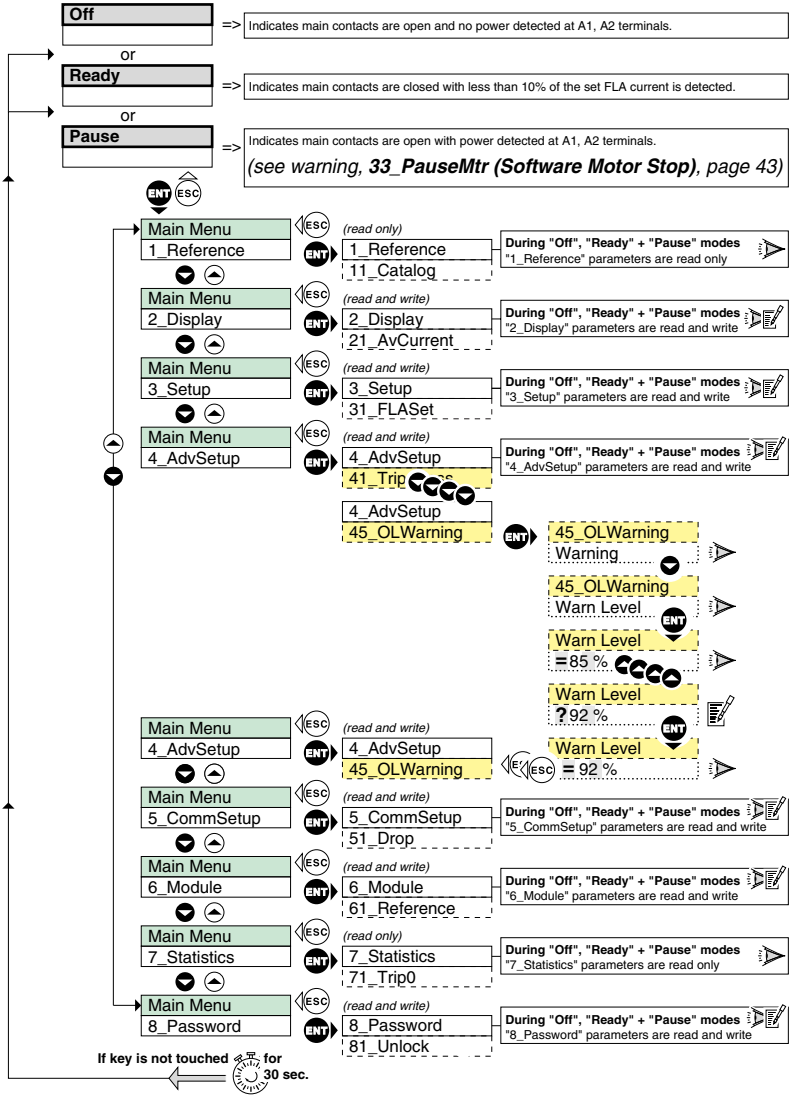
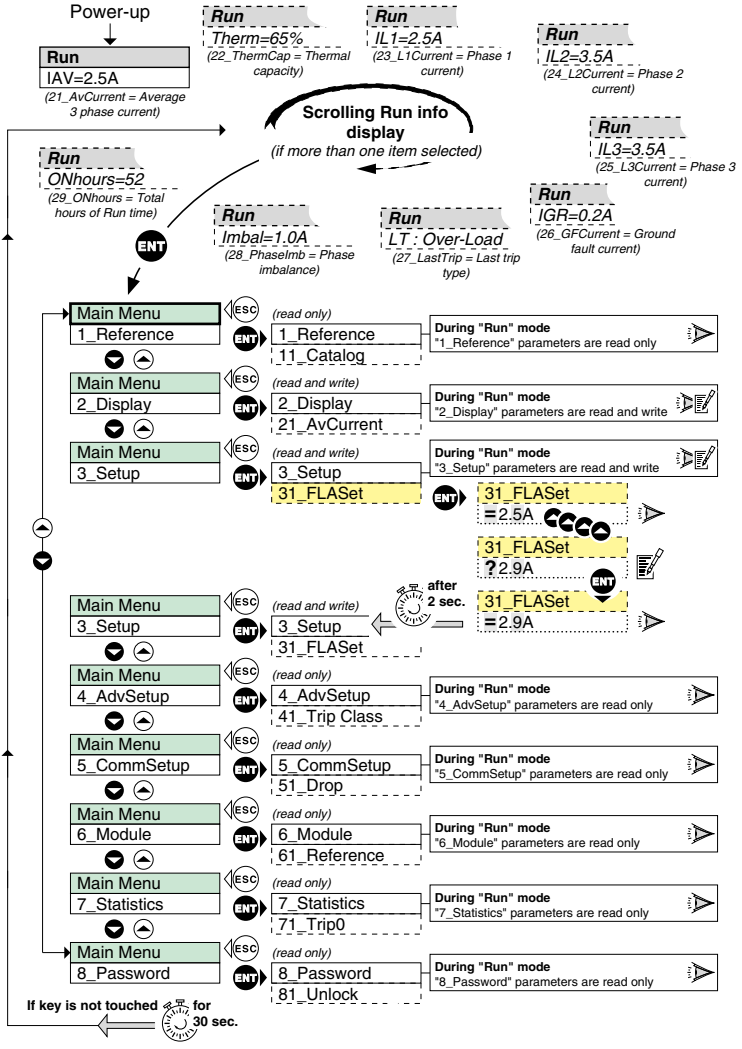
2-2-2 "Off", "Ready" and "Pause" modes (subsequent power-ups and settings)

- **Main Menu** *(page 35)* settings can be modified in the "**Off**", "**Ready**" or "**Pause**" modes. See , **33_PauseMtr** *(page 41)* function for enabling "**Pause**" mode.
- Should it be necessary to re-enter the **Config Menu (Configuration Menu)** *(page 27)* and change a configure setting, the user must first validade the **84_RstToDfts** *(page 77)* function. This resets all parameters back to factory default settings.



2-2-3 "Run" mode (settings)

- Line 1 of the display shows "**Run**" when the Power Base main contacts are closed and more than 10% of the set FLA current is detected.
- Line 2 of the display can be set to scroll certain information for monitoring *(see 2-5-2, **2_Display**, page 37)*.
- Only functions **2_Display** *(page 37)* and **3_Setup** *(page 41)* can be modified when the Multifunction Control Unit is in the "**Run**" **mode**.

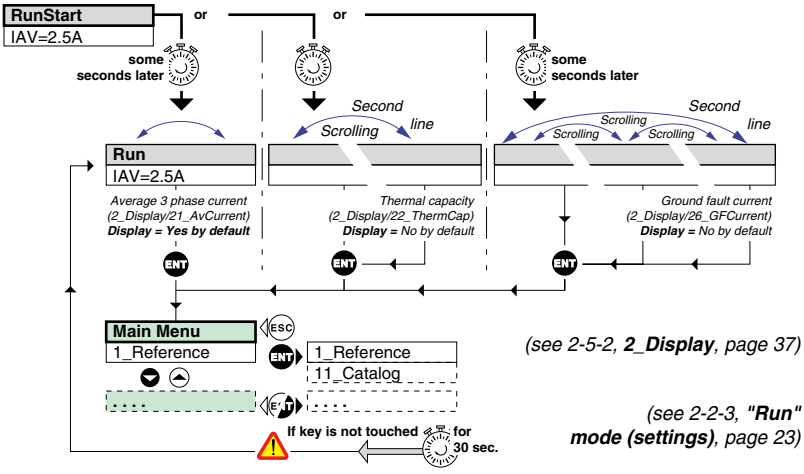


ENGLISH

2-3 Monitoring the motor

2-3-1 "Run" mode (monitoring)

- When the main power contacts are closed and more than 10% of the set FLA current is detected, line 1 of the display will show "**Start**" indicating the Multifunction Control Unit is waiting for the motor to complete it's start cycle.
- When the "**Start**" cycle has ended, the display will show "**Run**" indicating the **"Run" mode (monitoring)**. The user can then compare actual "**Run**" values with protection settings and make adjustments as necessary *(see 2-2-3, **"Run" mode (settings)**, page 23)*.

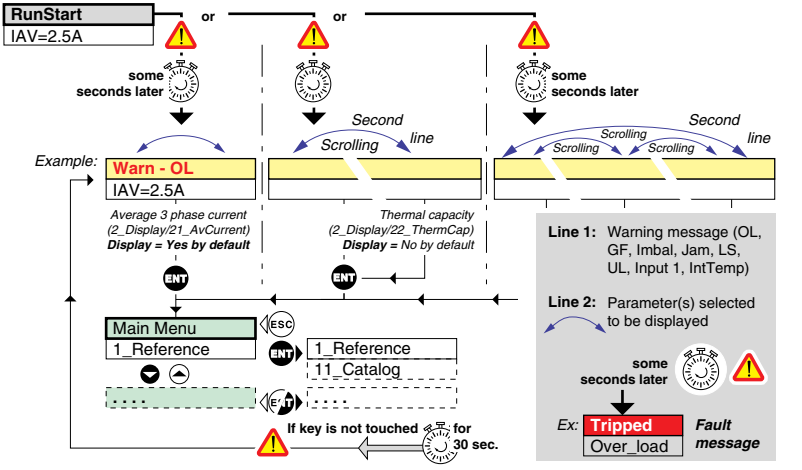


*(see 2-5-2, **2_Display**, page 37)*

*(see 2-2-3, **"Run" mode (settings)**, page 23)*

2-3-2 "Warning" mode (diagnostics)

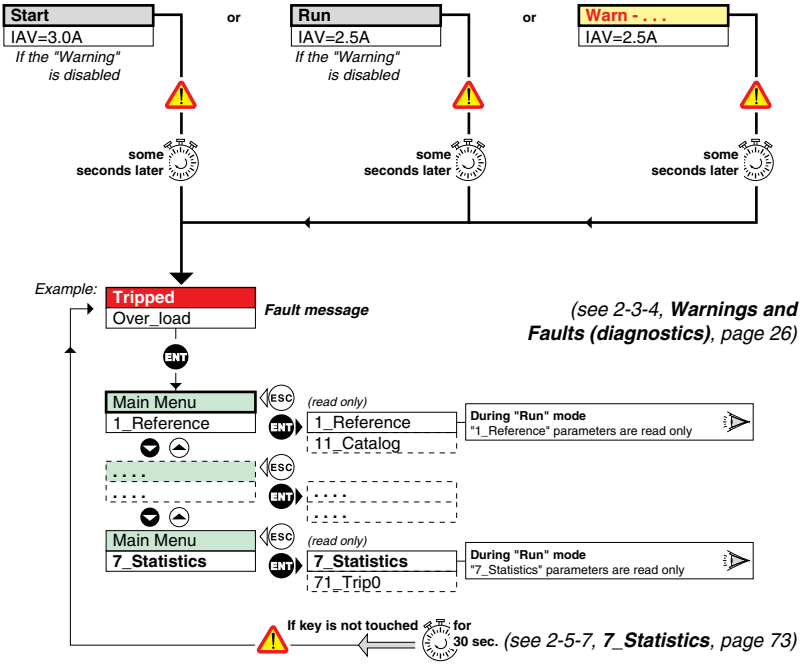
- When an enabled warning occurs, line 1 of the display will show "**Warn**" followed by the warning type *(see 2-3-4, **Warnings and Faults (diagnostics)**, page 26)*.
- By pressing **ENT** when a warning is displayed, the user may scrole through the settings and verify the set **Warn Level**. Adjustment of the **Warn Level** is done in "**Off**" mode *(see 2-2, p. 21)*.



2-3-3 "Fault" mode (diagnostics)

- Detected faults will either trip the base mechanism or open the power contacts depending on the fault type *(see 2-3-4, **Warnings and Faults (diagnostics)**, page 26)* and reset mode selected *(see , **42_ResetMode**, page 48)*.
- Faults that trip the base mechanism will show "**Tripped**" in the line 1 of the display and the fault type in the line 2. **A Manual Reset will be required before a restart can be made**.
- Faults that open the power contacts will show "**Off-Fault Type**" in line 1 of the display and "**Ent to Reset**" in line 2. Reset can be made by pressing the **ENT** key or sending a remote reset signal via the RS 485 communication port or by an optional module. "**Over_load**" and "**Test Trip**" faults will show "**Wait**" and the delay in seconds before "**Ent to Reset**" appears.

  NOTE: *On the **LUCM••BL**, resetting "**Off-**" faults will automatically start the motor if coil control power is still applied to A1, A2 terminals.*
  *Tripped fault types can not be displayed without auxiliary control power to the **LUCM••BL**.*



- Faults that show "**Int Trip**" in line 1 of the display and Fault type code in line 2, indicate internal Faults detected by the Multifunction Control Unit. A **Manual Reset** and cycling of the auxilliary control power from On to Off will be required before a Restart can be made.

2-3-4 Warnings and Faults (diagnostics)

Warning or Fault Type	Warning message	Fault Message "Manual" Mode	"Remote/Ent" Mode	"Auto" Mode
Thermal Overload	Warn-OL (scrolled Run info)	Tripped Over_Load	Off-OL Wait xxx *(Secs)*	Off-OL Auto xxx *(Secs)*
Short circuit Fault *(LUCM••BL only)*	*These faults will reset automaticaly in the LUCMT1BL* — *Line 1* / *Line 2*	Tripped Short	Tripped Short	Tripped Short
Shunt trip Fault *(LUCM••BL only)*		Tripped Shunt	Tripped Shunt	Tripped Shunt
Magnetic Fault *(LUCM••BL only)*		Tripped MagTrip	Tripped MagTrip	Tripped MagTrip
Ground Fault	Warn-GF (scrolled Run info)	Tripped Ground Fault	Tripped Ground Fault	Tripped Ground Fault
Phase Imbalance Fault	Warn-Imbal (scrolled Run info)	Tripped PhasImb	Off-Imbal Ent to Reset	Off-Imbal Ent to Reset
Jam Fault	Warn-Jam (scrolled Run info)	Tripped Jam	Off-Jam Ent to Reset	Off-Jam Ent to Reset
Long Start Fault	Warn-LongSt (scrolled Run info)	Tripped LngStrt	Off-LongSt Ent to Reset	Off-LongSt Ent to Reset
Under Load Fault	Warn-UndrLd (scrolled Run info)	Tripped UnderLoad	Off-UndrLd Ent to Reset	Off-UndrLd Ent to Reset
Test Trip Fault		Tripped TestTrp	Off-Test Wait xxx *(Secs)*	Off-Test Auto xxx *(Secs)*
Internal Fault *(see list below fault type)*		Int Trip xx	Int Trip xx	Int Trip xx
Internal temperature Fault	Warn-Int Temp (scrolled Run info)	Int Trip 51	Int Trip 51	Int Trip 51

Type	Warning Mode	Trip Mode	Dropout Mode
Lost Communications Fault	Warn-Comm (scrolled Run info)	Tripped CommLoss	Off-Comm Ent to Reset
Option Module Fault *	Warn-Mxxx (scrolled Run info)	Tripped Mxxx	Off-Mxxx Ent to Reset

* See option module instruction material for fault codes.

Mxxx : indicates Warning, Dropout or Fault code. See option module instruction manual for Fault code identification.

Fault Code	Internal Fault Type
51	Multifunction Control Unit Internal Temperature *(see 1-3-2, **Operating temperatures**, page 10)*
52	Asic read-after-write
53	Asic initialize check
54	Coil control and Asic watchdog
55	Stack Overflow check
56	RAM check

Fault Code	Internal Fault Type
57	ROM (flash) check
58	Hardware Watchdog
59	Current detected while OFF
60	(L2 current) detected in 1-Phase Mode
61	Base trip not detected
62	Control wiring fault
63	Control overvoltage
"EEROM Error"	EE Prom checksum

2-4 Config Menu (Configuration Menu)

- The **Config Menu (Configuration Menu)** is the initial menu displayed by the Multifunction Control Unit as shipped from the factory.
- It contains the configuration settings that are equipment specific. These settings are not typically adjusted after initial configuration.
- To exit the **Config Menu (Configuration Menu)**, you must save the **End Config** function.
- To access the **Config Menu (Configuration Menu)** after the **End Config** is saved, the Multifunction Control Unit must be reset to default factory settings *(see **84_RstToDfts**, page 77).*
- These settings are always viewable in the **1_Reference** *(page 35)* menu.
- The CT_Ratio function in the **LUCMT1BL** must be set before accessing the **End Config** function.

Menu *(line 1)*		**Function** *(line 2)*	**Definition**
Config Menu		Language *(see 2-4-1, p. 28)*	Selects the language used in the Multifunction Control Unit display. ***NOTE:*** *Language type can also be selected in **34_Language** (page 42).*
		LoadType *(see 2-4-2, p. 28)* **(for LUCM••BL only)**	Sets motor protection functions for 3-phase or 1-phase. ***NOTE:*** *Selecting the 1-phase setting with 3-phase motors will cause an internal trip 60 indicating **24_L2Current** detected in 1-phase mode.*
	▲ ▼	Base *(see 2-4-3, p. 28)* **(for LUCM••BL only)**	*(see **CAUTION**, page 28)* Identifies the type of Power Base in which the Multifunction Control Unit will be installed. The Power Base type is marked on the side of the base device. ***NOTE:*** *This function serves as an identifier only. It does not influence the protection functions, settings or type of protection that the Power Base provides.*
		AuxFan *(see 2-4-4, p. 29)*	*(see **CAUTION**, page 29)* Sets thermal protection settings for motors cooled by auxiliary fans. ***NOTE:*** *When enabled, effective thermal reset time is reduced by a factor of 4. For reset times, See Appendix A - **Thermal Trip and Reset curves** (page 81).*
		CT_Ratio *(see 2-4-5, p. 29)* **(for LUCMT1BL only)**	*(see **CAUTION**, page 29)* Sets current scale in Amperes for protection settings and display values. The CT_Ratio is set for the current transformers sellected for the application. ***NOTE:*** *CT_Ratio must be set before enabling the **End Config** (page 34) function.*
		End Config *(see 2-4-6, p. 34)*	Sets initial configuration and enables the **Main Menu** *(page 35)*. ***NOTE:*** *Once **End Config** (page 34) is saved, the **Config Menu (Configuration Menu)** is accessed by resetting the device back to factory default settings (see **84_RstToDfts**, page 77).*
	NOTE: *Press ▼ or ▲ to enable stepping through all the display functions.*		
	ENT : *Sends to functions settings.*		

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2-4-1 Language (Unit Display Language)

Function *(line 1)*		Setting *(line 2)*	Definition
Language		= English	Sets display to English. **Enabled by default.**
	▲	? Français	Sets display to French.
	▼	? Español	Sets display to Spanish **(for LUCM••BL only)**.
		? Deutsch	Sets display to German **(for LUCM••BL only)**.
		? Italiano	Sets display to Italian **(for LUCM••BL only)**.
		ENT : *Saves setting and returns to* ***Config Menu*** *(page 27).*	
		ESC : *Does not save a setting, returns to* ***Config Menu*** *(page 27).*	

2-4-2 LoadType (Motor Load Type)

NOTE: *Load Type sets the calculated average current value in the Multifunction Control Unit as follows:*

3-Phase Load setting - I Average = (I1 + I2 + I3) / 3

1-Phase Load setting - I Average = (I1 + I2 + I3) / 2

Function *(line 1)*		Setting *(line 2)*	Definition
LoadType **(for LUCM••BL only)**	▲	= 3 PhMotor	Sets unit configuration to three phase motor protection. **Enabled by default.**
	▼	? 1 PhMotor	Sets unit configuration for single phase motor protection.
		ENT : *Saves setting and returns to* ***Config Menu*** *(page 27).*	
		ESC : *Does not save a setting, returns to* ***Config Menu*** *(page 27)*	

2-4-3 Base (Motor Starter Power Base Type)

⚠ CAUTION

Incorrect Power Base setting

- Changing the Power Base setting does not affect motor protection functions or current interruption capacity of the Power Base,
- Setting incorrect Power Base may cause the wrong Power Base to be read and displayed by the LCD or remote network device.

Incorrect setting of the Power Base function can result in serious injury, or equipment damage.

Function *(line 1)*		Setting *(line 2)*	Definition
Base **(for LUCM••BL only)**	▲	= SelfProtStr	Sets identification reference for a self-protected motor starter, which provides both short circuit and overload protection for a motor branch circuit. **Enabled by default.**
	▼	? Starter	Sets identification reference for a motor starter, which provides only overload protection for a motor branch circuit.
		ENT : *Saves setting and returns to* ***Config Menu*** *(page 27).*	
		ESC : *Does not save a setting, returns to* ***Config Menu*** *(page 27)*	

2-4-4 AuxFan (Auxiliary Fan Cooled Motor)

⚠ CAUTION

Incorrect AuxFan setting

- When the AuxFan option is set, the reset (motor cool down) time is reduced by a factor of 4,
- If the motor is **not** equipped with an operating auxiliary cooling fan, the calculated thermal capacity will be incorrect.

Incorrect setting of the AuxFan function can result in injury, or equipment damage.

Function *(line 1)*		Setting *(line 2)*	Definition
AuxFan	▲▼	= No	Disables Auxiliary Fan Cooled function setting thermal protection levels for motors **not cooled** by auxiliary fans. **Disabled by default.**
		? Yes	Enables Auxiliary Fan Cooled function setting thermal protection levels for motors **cooled** by auxiliary fans.
		ENT : *Saves setting and returns to* ***Config Menu*** *(page 27).*	
		ESC : *Does not save a setting, returns to* ***Config Menu*** *(page 27).*	

2-4-5 CT_Ratio (Current Transformer Ratio)

⚠ CAUTION

Incorrect CT_Ratio setting

- The CT_Ratio must be set to match the current transformer being used,
- CT_Ratio sets default values for FLA and other motor protection functions.

Incorrect setting of CT_Ratio function can result in injury, or equipment damage.

Function *(line 1)*		Parameter *(line 2)*	Definition
CT_Ratio **(for LUCMT1BL only)**	▲▼	•••	**No default value ==> must be set.**
		? 30:3 *(see 2-4-5-1, p. 30)*	Sets FLA current scale for current transformers with a 30:3 (primary current/secondary current) ratio. *(see* ***31_FLASet****, page 41)*
		? 30:2 *(see 2-4-5-2, p. 30)*	Sets FLA current scale for current transformers with a 30:2 (primary current/secondary current) ratio. *(see* ***31_FLASet****, page 41)*
		? 30:1 *(see 2-4-5-3, p. 30)*	Sets FLA current scale for current transformers with a 30:1 (primary current/secondary current) ratio. *(see* ***31_FLASet****, page 41)*
		? 50:1 *(see 2-4-5-4, p. 31)*	Sets FLA current scale for current transformers with a 50:1 (primary current/secondary current) ratio. *(see* ***31_FLASet****, page 41)*
		? 100:1 *(see 2-4-5-5, p. 31)*	Sets FLA current scale for current transformers with a 100:1 (primary current/secondary current) ratio. *(see* ***31_FLASet****, page 41)*
		? 200:1 *(see 2-4-5-6, p. 31)*	Sets FLA current scale for current transformers with a 200:1 (primary current/secondary current) ratio. *(see* ***31_FLASet****, page 41)*

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(CT_Ratio) **(for LUCM•BL only)**	▲▼	? 400:1 *(see 2-4-5-7, p. 31)*	Sets FLA current scale for current transformers with a 400:1 (primary current/secondary current) ratio. *(see **31_FLASet**, page 41)*
		? 800:1 *(see 2-4-5-8, p. 32)*	Sets FLA current scale for current transformers with a 800:1 (primary current/secondary current) ratio. *(see **31_FLASet**, page 41)*
		? Others *(see 2-4-5-9, p. 32)*	Sets FLA current scale for current transformers ratios not shown above. *(see **31_FLASet**, page 41)*
	***NOTE:** Press ▼ or ▲ to enable stepping through all the CT_Ratio parameters.*		
	***ENT :** Sends to parameters settings.*		
	***ESC :** Does not save a setting, returns to **Config Menu** (page 27).*		

2-4-5-1 **30:3**

Parameter *(line 1)*		Setting *(line 2)*	Definition
? 30:3	▲	= No	Returns to CT_Ratio parameter selection *(page 27)*
	▼	? Yes	Sets CT_Ratio to 30:3. Sets FLASet range to 3.5 - 10.5 Amps *(see **31_FLASet**, page 42).*
	***ENT :** Saves setting and returns to **CT_Ratio** (page 29).*		
	***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*		

2-4-5-2 **30:2**

Parameter *(line 1)*		Setting *(line 2)*	Definition
? 30:2	▲	= No	Returns to CT_Ratio parameter selection *(page 27)*
	▼	? Yes	Sets CT_Ratio to 30:2. Sets FLASet range to 5.2 - 15.7 Amps *(see **31_FLASet**, page 42).*
	***ENT :** Saves setting and returns to **CT_Ratio** (page 29).*		
	***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*		

2-4-5-3 **30:1**

Parameter *(line 1)*		Setting *(line 2)*	Definition
? 30:1	▲	= No	Returns to CT_Ratio parameter selection *(page 27)*
	▼	? Yes	Sets CT_Ratio to 30:1. Sets FLASet range to 10.5 - 31.5 Amps *(see **31_FLASet**, page 42).*
	***ENT :** Saves setting and returns to **CT_Ratio** (page 29).*		
	***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*		

2-4-5-4 50:1

Parameter *(line 1)*		Setting *(line 2)*	Definition
? 50:1	▲	= No	Returns to CT_Ratio parameter selection *(page 27)*
	▼	? Yes	Sets CT_Ratio to 50:1. Sets FLASet range to 17.5 - 52.5 Amps *(see **31_FLASet**, page 42).*
		***ENT :** Saves setting and returns to **CT_Ratio** (page 29).*	
		***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*	

2-4-5-5 100:1

Parameter *(line 1)*		Setting *(line 2)*	Definition
? 100:1	▲	= No	Returns to CT_Ratio parameter selection *(page 27)*
	▼	? Yes	Sets CT_Ratio to 100:1. Sets FLASet range to 35 - 105 Amps *(see **31_FLASet**, page 42).*
		***ENT :** Saves setting and returns to **CT_Ratio** (page 29).*	
		***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*	

2-4-5-6 200:1

Parameter *(line 1)*		Setting *(line 2)*	Definition
? 200:1	▲	= No	Returns to CT_Ratio parameter selection *(page 27)*
	▼	? Yes	Sets CT_Ratio to 200:1. Sets FLASet range to 70 - 210 Amps *(see **31_FLASet**, page 42).*
		***ENT :** Saves setting and returns to **CT_Ratio** (page 29).*	
		***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*	

2-4-5-7 400:1

Parameter *(line 1)*		Setting *(line 2)*	Definition
? 400:1	▲	= No	Returns to CT_Ratio parameter selection *(page 27)*
	▼	? Yes	Sets CT_Ratio to4 800:1. Sets FLASet range to 140 - 420 Amps *(see **31_FLASet**, page 42).*
		***ENT :** Saves setting and returns to **CT_Ratio** (page 29).*	
		***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*	

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2-4-5-8 800:1

Parameter *(line 1)*		Setting *(line 2)*	Definition
? 800:1	▲	= No	Returns to CT_Ratio parameter selection *(page 27)*
	▼	? Yes	Sets CT_Ratio to 800:1. Sets FLASet range to 280 - 840 Amps *(see **31_FLASet**, page 42).*
		***ENT :** Saves setting and returns to **CT_Ratio** (page 29).*	
		***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*	

2-4-5-9 Others (Other Current Transformer Ratio Settings)

Parameter *(line 1)*		Parameter Submenu *(line 2)*	Definition
? Others	▲ ▼	Primary *(see 2-4-5-9-1, p. 32)*	Sets the current transformers primary current rating. The parameter is settable from 1 to 65535.
		Secondary *(see 2-4-5-9-2, p. 33)*	Sets the current transformers secondary current rating. The parameter is settable from 1 to 65000.
		Exter_Pass *(see 2-4-5-9-3, p. 33)*	Sets the number of passes through the current transformer core that have been made with the power (primary) wiring. Example: 2 would indicate two passes of the power wiring through the current transformer coil, doubling the current measured by the secondary of the current transformer. Parameter is settable from 1 to 65000
	***NOTE:** Press ▼ or ▲ to enable stepping through the Other parameters submenu.*		
	***ENT :** Sends to parameters submenu settings*		
	***ESC :** Does not save a setting, returns to **CT_Ratio** (page 29).*		

2-4-5-9-1 Primary (Primary Current Transformer Rating)

Parameter Submenu *(line 1)*	Setting *(line 2)*	Definition
Primary	= 00000	• Press the **ENT** key to begin parameters setting.
	= 00000 0_ _ _ _	<=== First digit of parameter setting.
	▲ = 00000 1_ _ _ _ ▲ ▲ ▲ ▲ = 00000 5_ _ _ _	• Press ▼ or ▲ to increment the first digit. (0 to 6)
	ENT = 50000 _0 _ _ _	• Press the **ENT** key to enter the first value and send to the second digit.

(Primary)	= 50000 _0 _ _ _ ▲ ▲ ▲ = 50000 _3 _ _ _ ENT = 53000 _ _0 _ _	• The same procedure is followed for the remaining digits. ***NOTE:*** *The Multifunction Control Unit will not allow a digit to scroll past the 65535 maximum value.* • Press the **ENT** key to enter the second value and send to the third digit.
	= 53210 _ _ _ _4 ENT = 53214	• When the last digit value has been selected and the **ENT** key pressed, the Primary setting will be set.
	ENT : *Saves setting and returns to* ***Primary*** *(page 32).*	
	ESC : *Does not save a setting, returns to* ***? Others*** *(page 32).*	

2-4-5-9-2 **Secondary** (Secondary Current Transformer Rating)

Parameter Submenu *(line 1)*	**Setting** *(line 2)*	**Definition**
Secondary	= 1	• Press the **ENT** key to begin parameters setting.
	▲ ? 1 ▲ ▲ .... ▲ ? 10	• Press ▼ or ▲ to increment the value. ***NOTE:*** *The Multifunction Control Unit will not allow a digit to scroll past the 65000 maximum value or a value that would allow a current transformer ratio (/) less than 1.*
	? 10 ENT = 10	• When the desired value has been selected and the **ENT** key pressed, the Secondary setting will be set.
	ENT : *Saves setting and returns to* ***? Others*** *(page 32).*	
	ESC : *Does not save a setting, returns to* ***? Others*** *(page 32).*	

2-4-5-9-3 **Exter_Pass** (Power Wiring Passes)

Parameter Submenu *(line 1)*	**Setting** *(line 2)*	**Definition**
Exter_Pass	= 1	• Press the **ENT** key to begin parameters setting.
	▲ ? 1 ▲ ? 2	• Press ▼ or ▲ to increment the value. ***NOTE:*** *The Multifunction Control Unit will not allow a digit to scroll past the 65000 maximum value or a value that would allow a current transformer ratio (/) less than 1.*
	? 2 ENT = 2	• When the desired value has been selected and the **ENT** key pressed, the Exter_Pass setting will be set.
	ENT : *Saves setting and returns to* ***? Others*** *(page 32).*	
	ESC : *Does not save a setting, returns to* ***? Others*** *(page 32).*	

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2-4-6 End Config (End Configuration Mode)

Function *(line 1)*		Setting *(line 2)*	Definition
End Config	▲▼	= No	Returns to **Config Menu (Configuration Menu)** *(page 27)*. **Disabled by default.**
		? Yes	Sets initial configuration and sends to **Main Menu** *(p. 35)*.
		ENT : *Saves setting.*	
		ESC : *Does not save a setting, returns to* ***Config Menu*** *(page 27).*	

2-5 Main Menu

- The **Main Menu** is the initial menu displayed after the Multifunction Control Unit has been configured.
- It contains all the user menus for:
  - setting protection functions,
  - configuration of optional communication and I/O modules,
  - accessing stored statistical information,
  - setting display characteristics.

Menu *(line 1)*		Submenu *(line 2)*	Definition
Main Menu		1_Reference *(see 2-5-1, p. 36)*	Displays Multifunction Control Unit references and the **Config Menu (Configuration Menu)** *(page 27)* functions settings.
		2_Display *(see 2-5-2, p. 37)*	Sets type of information that scrolls on the Multifunction Control Unit display while in the **"Run" mode (monitoring)** *(page 24)*.
		3_Setup *(see 2-5-3, p. 41)*	Provides access to the basic unit protection and setup functions. These are functions that can be set while the unit is in the **"Run" mode (monitoring)** *(page 24)*.
	▲ ▼	4_AdvSetup *(see 2-5-4, p. 45)*	Provides access to the advanced protection functions.
		5_CommSetup *(see 2-5-5, p. 65)*	Provides access to the communication setting of the RS 485 external communication port.
		6_Module *(see 2-5-6, p. 69)*	Provides access to the functions and settings of optional communication and function modules.
		7_Statistics *(see 2-5-7, p. 73)*	Provides access to historical information data stored in the unit memory. Includes information on the last five faults, count totals and reset data.
		8_Password *(see 2-5-8, p. 76)*	Provides password protection to prevent unauthorized changes to configurable functions. Also provides access to unit function resets.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display Submenus.*		
	ENT : *Sends to Submenu.*		

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2-5-1 1_Reference

- The **1_Reference** submenu allows **READ only** access to product references and the functions set in the **Config Menu (Configuration Menu)**.
- They can be viewed in either the **"Run" mode (settings)** *(page 23)* or **Configuration and settings** *(page 21)*:

Menu Submenu *(line 1, line 2)*			Function Reference *(line 1, line 2)*	Definition
(Main Menu) 1_Reference	ENT		11_Catalog **LUCMx6BL**	- Catalog number is displayed Line 2.
			12_Firmware **Rev: xx.xx**	- Firmware revision is displayed Line 2.
		▲▼	13_FLA Range **0.15 A to 0.6 A**	- Minimum to maximum (Amps) motor current setting range is displayed Line 2. *(see 2-5-3-1, **31_FLASet (Full Load Amp Setting)**, page 42)*
			14_LoadType **= 3 PhMotor**	*(same setting as § 2-4-2)* **(read only)** The **Motor Load Type** function is displayed Line 2.
			15_AuxFan **= No**	*(same setting as § 2-4-4)* **(read only)** The **Auxiliary Fan Cooled Motor** function is displayed Line 2.
			16_PowerBase **= SelfProtStr**	*(same setting as § 2-4-3)* **(read only)** The **Motor Starter Power Base Type** function is displayed Line 2.
	ENT : *Sends to functions for viewing.*			
		NOTE: *Press ▼ or ▲ to enable stepping through all the function references.*		
			ESC : *Returns to **Main Menu** (page 35).*	

2-5-2 2_Display

- The **2_Display** submenu allows access to the viewable **"Run" mode (settings)** values shown on the unit display *(see 2-2-3, **"Run" mode (settings)**, page 23)*.
- These functions can be enabled or disabled in either the **"Run" mode (settings)** *(page 23)* or **"Config" mode (first power-up: configuration and settings)** *(page 21)* or **"Off", "Ready" and "Pause" modes (subsequent power-ups and settings)** *(page 22)*

Submenu *(line 1)*		Function *(line 2)*	Definition
2_Display		21_AvCurrent *(see 2-5-2-1, p. 38)*	Sets the Multifunction Control Unit display to show **Average Three Phase Current** while in the **"Run" mode (settings)** *(page 23)*.
		22_ThermCap *(see 2-5-2-2, p. 38)*	Sets the Multifunction Control Unit display to show **Thermal Capacity used** while in the **"Run" mode (settings)** *(page 23)*.
		23_L1Current *(see 2-5-2-3, p. 38)*	Sets the Multifunction Control Unit display to show the **Current measured in L1T1** while in the **"Run" mode (settings)** *(page 23)*.
	▲▼	24_L2Current *(see 2-5-2-4, p. 39)*	Sets the Multifunction Control Unit display to show the **Current measured in L2T2** while in the **"Run" mode (settings)** *(page 23)*.
		25_L3Current *(see 2-5-2-5, p. 39)*	Sets the Multifunction Control Unit display to show the **Current measured in L3T3** while in the **"Run" mode (settings)** *(page 23)*.
		26_GFCurrent *(see 2-5-2-6, p. 39)*	Sets the Multifunction Control Unit display to show the **Ground Fault Current** measured while in the **"Run" mode (settings)** *(page 23)*.
		27_LastTrip *(see 2-5-2-7, p. 40)*	Sets the Multifunction Control Unit display to show the **Last Fault Type** while in the **"Run" mode (settings)** *(page 23)*.
		28_PhaseImb *(see 2-5-2-8, p. 40)*	Sets the Multifunction Control Unit display to show the percentage of **Phase Imbalance Current** measured while in the **"Run" mode (settings)** *(p. 23)*.
		29_ONhours *(see 2-5-2-9, p. 40)*	Sets the Multifunction Control Unit display to show the number of **Total hours** detected while in the **"Run" mode (settings)** *(p. 23)*.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display functions.*		
	ENT : *Sends to functions settings.*		
	ESC : *Returns to **Main Menu** (page 35).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the **"Run" mode (settings)** (page 23), the scrolling display shall resume.*		

ENGLISH

2-5-2-1 21_AvCurrent (Average Three Phase Current)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
21_AvCurrent		**= Yes**	Sets display to scroll **Average Three Phase Current** or single-phase current in the **"Run" mode (settings)** *(page 23)*. **Enabled by default.**	**Amps**
		? No	Disables the display of **Average Three Phase Current** or single-phase current in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *.Does not save a setting, returns to* ***2_Display*** *(page 37)*		

2-5-2-2 22_ThermCap (Thermal Capacity used)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
22_ThermCap		**= No**	Disables the display of **Thermal Capacity used** in the **"Run" mode (settings)** *(page 23)*. **Disabled by default.**	**%**
		? Yes	Sets display to scroll **Thermal Capacity used** in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *Does not save a setting, returns to* ***2_Display*** *(page 37).*		

2-5-2-3 23_L1Current (Current measured in L1T1)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
23_L1Current		**= No**	Disables the display of **Current measured in L1T1** in the **"Run" mode (settings)** *(page 23)*. **Disabled by default.**	**Amps**
		? Yes	Sets display to scroll **Current measured in L1T1** in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *Does not save a setting, returns to* ***2_Display*** *(page 37).*		

2-5-2-4 **24_L2Current** (Current measured in L2T2)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
24_L2Current	▲▼	= No	Disables the display of **Current measured in L2T2** in the **"Run" mode (settings)** *(page 23)*. **Disabled by default.**	**Amps**
		? Yes	Sets display to scroll **Current measured in L2T2** in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *Does not save a setting, returns to* ***2_Display*** *(page 37).*		

2-5-2-5 **25_L3Current** (Current measured in L3T3)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
25_L3Current	▲▼	= No	Disables the display of **Current measured in L3T3** in the **"Run" mode (settings)** *(page 23)*. **Disabled by default.**	**Amps**
		? Yes	Sets display to scroll **Current measured in L3T3** in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *Does not save a setting, returns to* ***2_Display*** *(page 37).*		

2-5-2-6 **26_GFCurrent** (Ground Fault Current)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
26_GFCurrent	▲▼	= No	Disables the display of the **Ground Fault Current** in the **"Run" mode (settings)** *(page 23)*. **Disabled by default.** *(see* ***46_GroundFlt****, page 46)*	**Amps**
		? Yes	Sets display to scroll the **Ground Fault Current** in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *Does not save a setting, returns to* ***2_Display*** *(page 37).*		

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2-5-2-7 27_LastTrip (Last Fault Type)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
27_LastTrip		= No	Disables the display of the **Last Fault Type** in the **"Run" mode (settings)** *(page 23)*. **Disabled by default.**	-
		? Yes	Sets display to scroll the **Last Fault Type** in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *Does not save a setting, returns to* ***2_Display*** *(page 37).*		

2-5-2-8 28_PhaseImb (Phase Imbalance Current)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
28_PhaseImb		= No	Disables the display of the **Phase Imbalance Current** in the **"Run" mode (settings)** *(page 23)*. **Disabled by default.**	%
		? Yes	Sets display to scroll the percentage of **Phase Imbalance Current** measured in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *Does not save a setting, returns to* ***2_Display*** *(page 37).*		

2-5-2-9 29_ONhours (Total hours)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
29_ONhours		= No	Disables the display of the **Total hours** in the **"Run" mode (settings)** *(page 23)*. **Disabled by default.**	hrs
		? Yes	Sets display to scroll the hrs of **Total hours** detected in the **"Run" mode (settings)** *(page 23)*.	
		ENT : *Saves setting and returns to* ***2_Display*** *(page 37).*		
		ESC : *Does not save a setting, returns to* ***2_Display*** *(page 37).*		

2-5-3 3_Setup

- The **3_Setup** submenu allows access to basic setup functions.
- These functions can be enabled or disabled in either the **"Run" mode (settings)** *(page 23)* or **"Config" mode (first power-up: configuration and settings)** *(page 21)* or **"Off", "Ready" and "Pause" modes (subsequent power-ups and settings)** *(page 22)*.

⚠ WARNING

Improper / Inadvertant settings

- Setup values can be modified in **"Run" mode (settings)** *(page 23)*,
- Values can be set via the network,
- External programming devices must be write enabled,
- Power must be applied to set values,
- Use password to prevent unauthorized changes.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Submenu *(line 1)*		Function *(line 2)*	Definition
3_Setup		31_FLASet *(see 2-5-3-1, p. 42)*	*(see **WARNING**, page 42)* Sets the thermal overload protection level for a motor. The **Full Load Amp Setting** (FLA) corresponds to the maximum steady-state current that a motor can withstand.The FLAvalue is found on the motor name plate. ***NOTE:*** *This function sets the default levels for all protection functions based on a percentage of Full-Load current (% FLA).*
	▲ ▼	32_TestTrip *(see 2-5-3-2, p. 43)*	Initiates a **Test Thermal Overload Fault**. In **"Manual Reset" Mode**, the Power Base trips requiring a **Manual Reset**. Remote and automatic reset modes can also be tested by selecting that type of reset mode. *(see **42_ResetMode**, page 45)*. Restart of a motor after a test trip can only be made after the thermal memory timer has elapsed (120 seconds by default). For thermal memory timer adjustment *(see **43_RstAdjust**, page 45)*.
		33_PauseMtr *(see 2-5-3-3, p. 43)*	*(see **WARNING**, page 43)* Opens the main power contacts by : • de-energizing the contactor coil while coil control power is still applied to A1, A2 terminals on the **LU•B••** and **LU•S••** • de-energizing the output (13, 23) relays while +24V DC is still applied to inputs I1 and I2 on the **LUTM••BL**. ***NOTE:*** *Should the Multifunction Control Unit lose control power while in the "**Pause**" mode, it will return to the "**Pause**" mode when control power is reapplied.*

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Submenu *(line 1)*		Function *(line 2)*	Definition
(3_Setup)	▲▼	34_Language *(see 2-5-3-4, p. 44)*	Selects the Language used in the Multifunction Control Unit display. **NOTE:** *Language type is also selected in the* **Config Menu (Configuration Menu)** *(page 27).*
		35_PauseMode *(see 2-5-3-5, p. 44)*	Allows user to lockout the 33_PauseMtr function. *(see **33_PauseMtr**, page 41)*
	NOTE: *Press ▼ or ▲ to enable stepping through all the display functions.*		
	***ENT :** Sends to functions settings.*		
	***ESC :** Returns to **Main Menu** (page 35).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the **"Run" mode (settings)** (page 23), the scrolling display shall resume.*		

2-5-3-1 31_FLASet (Full Load Amp Setting)

⚠ WARNING

Incorrect FLA setting

- The FLA Adjustment must be set to match the Full Load Amp rating of the motor,
- FLA sets default values for other motor protection functions.

Incorrect setting of the FLA function can result in injury, or equipment damage.

Function *(line 1)*		Setting *(line 2)*							Definition
31_FLASet	▲▼	Determined by **Multifunction Control Unit** (reference)						Min to Max	Sets desired Full Load Amperes level.
		Range is fixed for these six references							
		LUCMx6BL	*LUCM1xBL*	*LUCM05BL*	*LUCM12BL*	*LUCM18BL*	*LUCM32BL*		
		= 0.15 A to ? 0.6 A	= 0.35 A to ? 1.4 A	= 1.25 A to ? 5 A	= 3 A to ? 12 A	= 4.5 A to ? 18 A	= 8 A to ? 32 A	Min to Max	Minimum setting is **Enabled by default**.
	▲▼	***Range is variable for this one reference***						Min to Max	Sets desired Full Load Amperes level. % CT_Ratio
		LUCMT1BL	**NOTE:** *Value range is set by CT_Ratio in the* **Config Menu (Configuration Menu)** *(page 27).* ***Value shown is for a** CT_Ratio **of 1:1**.*						
		= 0.35 A to ? 1.05 A							
	NOTE: *Press ▼ or ▲ to increment from the Min. value to the Max. value.*								
	***ENT :** Saves setting and returns to **3_Setup** (page 41).*								
	***ESC :** Does not save a setting, returns to **3_Setup** (page 41).*								

2-5-3-2 32_TestTrip (Test Thermal Overload Fault)

Function *(line 1)*		Setting *(line 2)*	Definition
32_TestTrip		= No	Disables the Test Trip function. **Disabled by default.**
		? Yes	Initiates a Test Trip.
		ENT : *Saves setting and returns to* ***3_Setup*** *(page 41).*	
		ESC : *Does not save a setting, returns to* ***3_Setup*** *(page 41).*	

NOTE: *The test trip orders can be only performed when the motor-starter is* ***running****.*

2-5-3-3 33_PauseMtr (Software Motor Stop)

⚠ WARNING

Unintended motor starting

- The PauseMtr function should never be used in place of a **Stop** or **Off** command,
- Equipment operation must conform with national and local safety regulations and codes.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Function *(line 1)*		Setting *(line 2)*	Definition
33_PauseMtr		= No	Allows closing of the main power contacts by energizing the coil with coil control power already applied to A1, A2 terminals on the **LU•B••** and **LU•S••** or energizing the output (13, 23) relays while +24V DC is still applied to inputs I1 and I2 on the **LUTM••BL**. **Disabled by default.**
		? Yes	Opens the main power contacts by de-energizing the contactor coil with coil control power still applied to A1, A2 terminals on the **LU•B••** and **LU•S••** or de-energizing the output (13, 23) relays while +24V DC is still applied to inputs I1 and I2 on the **LUTM••BL**.
		ENT : *Saves setting and returns to* ***3_Setup*** *(page 41).*	
		ESC : *Does not save a setting, returns to* ***3_Setup*** *(page 41).*	

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2-5-3-4 34_Language (Unit Display Language)

Function *(line 1)*		Setting *(line 2)*	Definition
34_Language		**= English**	Sets display to English. **Enabled by default.**
	▲	? Français	Sets display to French.
	▼	? Español	Sets display to Spanish (for LUCM••BL only).
		? Deutsch	Sets display to German (for LUCM••BL only).
		? Italiano	Sets display to Italian (for LUCM••BL only).
		***ENT :** Saves setting and returns to **3_Setup** (page 41).*	
		***ESC :** Does not save a setting, returns to **3_Setup** (page 41).*	

2-5-3-5 35_PauseMode (Software Motor Stop Lockout)

Function *(line 1)*		Setting *(line 2)*	Definition
35_PauseMode		**= Yes**	Allows opening and closing the main power contacts with the 33_PauseMtr function. *(see **33_PauseMtr**, page 41).* **Enabled by default.**
	▲ ▼	? No	Allows user to lockout the 33_PauseMtr function so that the main power contacts cannot be opened or closed with the 33_PauseMtr function *(see **33_PauseMtr**, page 41).*
		***ENT :** Saves setting and returns to **3_Setup** (page 41).*	
		***ESC :** Does not save a setting, returns to **3_Setup** (page 41).*	

2-5-4 4_AdvSetup

- Provides access to advanced protection functions and parameters.
- These functions can be enabled or disabled when the Multifunction Control Unit is in the **"Config" mode (first power-up: configuration and settings)** *(page 21)* or **"Off", "Ready" and "Pause" modes (subsequent power-ups and settings)** *(page 22)*.
- These functions can always be viewed in either the **"Run" mode (settings)** *(page 23)* or **"Config" mode (first power-up: configuration and settings)** *(page 21)* or **"Off", "Ready" and "Pause" modes (subsequent power-ups and settings)** *(page 22)*.

Submenu *(line 1)*		Function *(line 2)*	Definition
4_AdvSetup		41_TripClass *(see 2-5-4-1, p. 47)*	*(see **CAUTION**, page 47)* Sets **Motor Trip Class** which represents the nominal thermal trip time (in seconds) during a 600% FLA overload condition. Setting range from 5 to 30 in increments of 5 *(see Appendix A - , **Thermal Trip and Reset curves**, page 81).*
		42_ResetMode *(see 2-5-4-2, p. 48)*	*(see **DANGER**, page 48)* Defines the method of resetting the device after fault detection *(see **"Fault" mode (diagnostics)**, page 25)*. See 2-3-4, **Warnings and Faults (diagnostics)** *(page 26)* for fault and reset messages.
		43_RstAdjust *(see 2-5-4-3, p. 50)*	*(see **CAUTION**, page 50)* Sets the time delay and thermal capacity level required before the reset of a thermal overload fault can be made. Both the adjustable **ResetTime** *(page 50)* and **ResetLevel** *(page 50)* parameters in this function must be reached before a restart is allowed. ***NOTE:*** *Selecting **"Manual Reset" Mode** (see **42_ResetMode**, page 48) or cycling coil control power to A1, A2 terminals resets the thermal fault, but not the internal thermal memory timer.* *A fault trip may reoccur immediately after restart if the internal thermal capacity of the Multifunction Control Unit is exceeded.*
		44_MagTrip *(see 2-5-4-4, p. 51)* **(for LUCM••BL only)**	*(see **DANGER**, page 51)* Sets level of **Magnetic Overload Protection** for the Self Protected Starter Power Base. Trips the base device if the magnetic trip setting is exceeded for more than 100 ms.
		45_OLWarning *(see 2-5-4-5, p. 51)*	Sets the **Thermal Overload Warning** function. The **Warning** *(page 52)* is activated if the thermal capacity of the motor reaches the set percentage of its capacity. **Warning** *(page 52)* deactivates if thermal capacity drops below set **Warn Level** *(page 52)*.

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Submenu *(line 1)*		Function *(line 2)*	Definition
(4_AdvSetup)		46_GroundFlt *(see 2-5-4-6, p. 53)*	*(see **DANGER**, page 53)* Sets the **Ground Fault Protection** function. **Trip** *(page 54)* parameters can be set for ground currents that exceed a set **TripLevel** *(page 54)* for a set **TripTime** *(page 54)* delay. **Warning** *(page 54)* parameters can be set for ground currents that exceed a set **Warn Level** *(page 55)*.
		47_PhaseImb *(see 2-5-4-7, p. 56)*	*(see **WARNING**, page 56)* Sets the **Phase Imbalance / Phase Loss Protection** function. **Trip** *(page 57)* parameters can be set for currents that differ in one phase by more than a set percentage from the average current in all three phases for a set time period. Different time delays can be set for motor startup **TripTimeStrt** *(p. 57)* and for normal run **TripTimeRun** *(page 58)* conditions. **Warning** *(page 58)* parameter can be set for imbalance / loss currents that exceed a set **Warn Level** *(page 58)*. ***NOTE:*** *The **Phase Imbalance / Phase Loss Protection** function is automatically disabled if Multifunction Control Unit is configured for single-phase motor loads (see **LoadType**, page 28).*
		48_Jam *(see 2-5-4-8, p. 59)*	Sets the **Jam Protection** function. **Trip** *(page 59)* parameters can be set for RMS current that exceed a set **TripLevel** *(page 60)* for a set **TripTime** *(page 60)* period after the **Run Start Cycle** *(page 79)* has ended. **Warning** *(page 60)* parameter can be set for jam currents that exceed a set **Warn Level** *(page 60)*. ***NOTE:*** *For configuration of the **Run Start Cycle** time, see **410_LongStrt** (page 47).*
		49_UnderLoad *(see 2-5-4-9, p. 61)*	Sets the **Under Load Protection**. **Trip** *(page 61)* parameter can be set for RMS currents that fall below a set **TripLevel** *(page 62)* for a set **TripTime** *(page 62)* period after the **Run Start Cycle** *(page 79)* has ended. **Warning** *(page 62)* parameters can be set for Underload currents that fall below a set **Warn Level** *(page 62)*. ***NOTE:*** *For configuration of the **Run Start Cycle** (page 79) time, see **410_LongStrt** (page 47).*

Submenu *(line 1)*		Function *(line 2)*	Definition
(4_AdvSetup)	▲ ▼	410_LongStrt *(see 2-5-4-10, p. 63)*	Sets the **Long Start Protection** function. **Trip** *(page 63)* parameters can be set for RMS currents that exceed a set **TripLevel** *(page 64)* after a set **Run Start Cycle** *(page 79)* time has ended. **Warning** *(page 64)* parameters can be set for Long Start currents that exceed a set **Warn Level** *(page 64)*. ***NOTE:*** *The **Run Start Cycle** is defined as the period of time allowed for a motor to obtain its normal full load current level after power is applied to the A1, A2 terminals.* *For more information, see **Run Start Cycle** (page 79).*
	NOTE: *Press ▼ or ▲ to enable stepping through all the display functions.*		
	ENT : *Sends to functions settings.*		
	ESC : *Returns to **Main Menu** (page 35).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the **"Run" mode (settings)** (page 23), the scrolling display shall resume.*		

2-5-4-1 41_TripClass (Motor Trip Class)

CAUTION

Incorrect Trip Class setting

- The Trip Class Adjustment must be set to match the thermal heating characteristics of the motor.

Incorrect setting of the Trip Class function can result in equipment damage.

Function *(line 1)*		Setting *(line 2)*	Definition
41_TripClass	▲ ▼	**= 5**	Sets trip time to 5 seconds for an overload of 600% FLA. **Enabled by default.**
		? 10	Sets trip time to 10 seconds for an overload of 600% FLA.
		? 15	Sets trip time to 15 seconds for an overload of 600% FLA.
		? 20	Sets trip time to 20 seconds for an overload of 600% FLA.
		? 25	Sets trip time to 25 seconds for an overload of 600% FLA.
		? 30	Sets trip time to 30 seconds for an overload of 600% FLA.
	ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*		
	ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45).*		

2-5-4-2 42_ResetMode (Fault Reset Mode)

⚠ DANGER

Unintended motor starting

- If A1, A2 power is present and Automatic Reset is selected, the motor will start running after the thermal reset timing period,
- Equipment operation must conform with national and local safety regulations and codes.

Failure to follow these instructions will result in death, serious injury, or equipment damage.

Function *(line 1)*		Setting *(line 2)*	Definition
42_ResetMode		= Manual	Sets the Multifunction Control Unit to trip the Power Base device if an enable fault condition is detected. A **Manual Reset** of the Power Base is required before a restart can be made. **Enabled by default**. ***NOTE:*** *In **"Manual Reset" Mode**, the thermal **ResetTime** (page 50) and **ResetLevel** (page 50) functions have no effect on **Thermal Overload Reset Delay**. The internal thermal memory function is enabled, and a fault trip may occur immediately after restart if the internal thermal capacity of the Multifunction Control Unit is exceeded.*
		? Remote/Ent	Sets the Multifunction Control Unit for remote resetting of thermal overload, **32_TestTrip** *(page 43)*, **410_LongStrt** *(page 63)*, **47_PhaseImb** *(p. 56)*, **49_UnderLoad** *(p. 61)*, **48_Jam** *(p. 59)*, communication and option module faults. Upon detecting a fault, the Multifunction Control Unit de-energizes the contactor coil without tripping the Power Base device. To reset the fault, do one of the following: • In applications using two-wire control, or with 24 V auxiliary power connected to the Multifunction Control Unit, press the **ENT** button on the keypad Multifunction Control Unit. ***NOTE:*** *With thermal faults (see **32_TestTrip**, page 43), a restart cannot occur until the thermal **ResetTime** (page 50) and **ResetLevel** (page 50) settings are reached. The time until reset is shown in the second line of display.* • Send a command through the network. • For applications using three-wire control, restart the motor. ***NOTE:*** *With thermal faults (see **32_TestTrip**, page 43), cycling power resets the fault, but not the internal thermal memory timer. A fault trip may reoccur immediately after restart if the internal thermal capacity of the Multifunction Control Unit is exceeded*

Function *(line 1)*		Setting *(line 2)*	Definition
(42_ResetMode)		? Auto	*(see **DANGER**, page 48)* Sets the Multifunction Control Unit for automatic reset of a thermal overload fault. • Upon detecting a fault, the Multifunction Control Unit de-energizes the contactor coil without tripping the base device. • For thermal fault, the Multifunction Control Unit automatically resets the Power Base device (closing the contactor coil) once the thermal **ResetTime** *(page 50)* and **ResetLevel** *(page 50)* settings are reached, the time until reset is shown in the command panel. To reset **410_LongStrt** *(page 63)*, **47_PhaseImb** *(page 56)*, **49_UnderLoad** *(page 61)*, **48_Jam** *(page 59)* and communication faults, do one of the following: • In applications using two-wire control, or with 24 V auxiliary power connected to the Multifunction Control Unit, activate the reset button in the command panel, or press the **ENT** button on the Multifunction Control Unit. • Send a command through the network. • For applications using three-wire control, restart the motor. ***NOTE:*** *This function requires either the use of two-wire control or the connection of 24 V auxiliary power to the Multifunction Control Unit.*
	NOTE: *Press ▼ or ▲ to enable stepping through all the display settings.*		
		ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*	
		ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45).*	

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2-5-4-3 43_RstAdjust (Thermal Overload Reset Delay)

⚠ CAUTION

Incorrect reset time setting

- The thermal reset parameter settings must allow sufficient time for the motor to cool after a thermal fault,
- Refer to motor manufacturer's instructions before setting this parameter.

Failure to follow these instructions can result in injury, or equipment damage.

Function *(line 1)*		Parameter *(line 2)*	Definition
43_RstAdjust	▲▼	ResetTime *(see 2-5-4-3-1, p. 50)*	Sets the duration of the **Thermal Overload Reset Delay** (in seconds) after a thermal fault.
		ResetLevel *(see 2-5-4-3-2, p. 50)*	Sets the level to which the motor's thermal capacity must drop before resetting a thermal fault.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display parameters.*		
	ENT : *Sends to parameters settings.*		
	ESC : *Returns to* ***4_AdvSetup*** *(page 45).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the* ***"Run" mode (settings)*** *(page 23), the scrolling display shall resume.*		

2-5-4-3-1 ResetTime

See appendix A-3 *(page 83)* or See appendix A-4 *(page 83).*

Parameter *(line 1)*		Setting *(line 2)*	Definition	Units
ResetTime	▲▼	= 120 Sec.	Use ▼ or ▲ to select the desired delay. The Reset Time parameter is adjustable from 1 to 1000 seconds in increments of 1 second.	Sec.
	ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*			
	ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*			

2-5-4-3-2 ResetLevel

Parameter *(line 1)*		Setting *(line 2)*	Definition	Units
ResetLevel	▲▼	= 80%	Use ▼ or ▲ to select the desired level. The Reset Level parameter is adjustable from 35 to 95% of the thermal capacity in increments of 5%. ***NOTE:*** *100% Thermal capacity is obtained at 112% FLA.*	% Capacity
	ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*			
	ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*			

2-5-4-4 44_MagTrip (Magnetic Overload Protection)

⚠ DANGER

Incorrect Magnetic Trip setting

- Equipment selection and settings must conform to national and local safety regulations and codes.

Failure to follow this instruction wil result in death, serious injury, or equipment damage.

Function *(line 1)*		Setting *(line 2)*	Definition	Units
44_MagTrip **(for LUCM••BL only)**	▲ ▼	**= 1420% FLA**	Use ▼ or ▲ to select the desired level. The **Magnetic Overload Protection** function is adjustable from 300 to 1700% of the FLA setting in increments of 20%. ***NOTE:*** *A **Magnetic Overload Protection** trip always trips the base mechanism requiring a **Manual Reset** of the base device regardless of the selected reset mode (see **42_ResetMode**, page 48).* ***NOTE:*** *The **Magnetic Overload Protection** trip level cannot exceed 1420% at the max FLA setting. For the 32 Ampere rated Multifunction Control Unit (LUCM32B), the **TripLevel** cannot exceed 1300% at the max FLA setting. The Multifunction Control Unit automatically decreases the Magnetic Trip level as the FLA setting increases.* ***NOTE:*** *The **Magnetic Overload Protection** function is **not available** when the Power Base type is set to **Starter** (see **Base**, page 28). The magnetic and instantaneous short circuit protection equipment must conform with national and local safety regulations and codes.*	**% FLA**
		***ENT :** Saves setting and returns to **4_AdvSetup** (page 45).*		
		***ESC :** Does not save a setting, returns to **4_AdvSetup** (page 45).*		

2-5-4-5 45_OLWarning (Thermal Overload Warning)

Function *(line 1)*		Parameter *(line 2)*	Definition
45_OLWarning	▲	Warning *(see 2-5-4-5-1, p. 52)*	The Warning parameter enables or disables the **Thermal Overload Warning** function.
	▼	Warn Level *(see 2-5-4-5-2, p. 52)*	Adjusts the Warn Level parameter.
		***ENT :** Saves setting and returns to **4_AdvSetup** (page 45).*	
		***ESC :** Does not save a setting, returns to **4_AdvSetup** (page 45).*	

2-5-4-5-1 Warning

Parameter (line 1)		Setting (line 2)	Definition
Warning	▲▼	= On	Enables the Warning parameter. **Enabled by default.**
		? Off	Disables the Warning parameter.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*	
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*	

2-5-4-5-2 Warn Level

Parameter (line 1)		Setting (line 2)	Definition	Units
Warn Level	▲▼	= 85%	Use ▼ or ▲ to select the desired level. The Warn Level parameter is adjustable from 10 to 100% of the thermal capacity in increments of 1%. ***NOTE:*** *100% Thermal capacity is obtained at 112% FLA.*	% Capacity
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-6 46_GroundFlt (Ground Fault Protection)

⚠ DANGER

Incorrect Ground Fault Trip setting

- Ground fault trip levels must be set to protect wiring and motor equipment,
- Settings must conform to national and local safety regulations and codes.

Disabled or high Trip Level settings will result in death, serious injury, or equipment damage.

Function *(line 1)*		Parameter *(line 2)*	Definition
46_GroundFlt		Trip *(see 2-5-4-6-1, p. 54)*	Enables or disables the **Ground Fault Protection** function. If the Multifunction Control Unit detects a continuous ground fault current above a set level, a trip of the base mechanism is initiated after the set **TripTime** *(page 54)* expires. ***NOTE:*** *If this parameter is enabled, a ground fault always trip the Power Base mechanism and will require a* ***Manual Reset*** *regardless of the selected reset mode (see* ***42_ResetMode****, page 48).*
	▲▼	TripTime *(see 2-5-4-6-2, p. 54)*	Sets the Ground Fault Trip Time parameter. The Trip Time parameter is defined as the delay (in seconds) before the Multifunction Control Unit initiates a trip upon detection of a **Ground Fault Protection** current above the set level.
		TripLevel *(see 2-5-4-6-3, p. 54)*	Sets the Ground Fault Trip Level parameter. The Trip Level parameter is defined as the level of continuous current at which the Multifunction Control Unit initiates a ground fault trip after the set **TripTime** *(page 54)* expires.
		Warning *(see 2-5-4-6-4, p. 54)*	Enables or disables the Ground Fault Warning function. A warning is activated if the Multifunction Control Unit detects a ground fault current above the set **Warn Level** *(page 55).*
		Warn Level *(see 2-5-4-6-5, p. 55)*	Sets the Ground Fault Warn Level parameter.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display parameters.*		
	ENT : *Sends to parameters settings.*		
	ESC : *Returns to* ***4_AdvSetup*** *(page 45).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the* ***"Run" mode (settings)*** *(page 23), the scrolling display shall resume.*		

ENGLISH

2-5-4-6-1 Trip

Parameter (line 1)		Setting (line 2)	Definition
Trip	▲▼	= On	Enables the Ground Fault Trip parameter. **Enabled by default.**
		? Off	Disables the Ground Fault Trip parameter.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*	
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*	

2-5-4-6-2 TripTime

Parameter (line 1)		Setting (line 2)	Definition	Units
TripTime	▲▼	= 1.0 Sec.	Use ▼ or ▲ to select the desired time can be selected. The Trip Time parameter is adjustable from 0.1 to 1.2 seconds in increments of 0.1 seconds. **Default setting is 1.0 second.**	Sec.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-6-3 TripLevel

Parameter (line 1)		Setting (line 2)	Definition	Units
TripLevel	▲▼	= x A	Use ▼ or ▲ to select the desired level. The Trip Level parameter is adjustable from 20 to 500% of the minimum FLA setting of the Multifunction Control Unit in **increments of 10%**. **Default setting is 30% of the minimum FLA setting.** ***Example:*** *The 0.15 to 0.60 Multifunction Control Unit has an adjustable range from 0.03 to 0.75 A in increments of 0.01 A, with a default setting of 0.04 A.*	Amps
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-6-4 Warning

Parameter (line 1)		Setting (line 2)	Definition
Warning	▲▼	= On	Enables the Warning parameter. **Enabled by default.**
		? Off	Disables the Warning parameter.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*	
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*	

2-5-4-6-5 Warn Level

Parameter *(line 1)*		Setting *(line 2)*	Definition	Units
Warn Level	▲ ▼	**= x A**	Use ▼ or ▲ to select the desired level. The Warn Level parameter is adjustable from 20 to 500% of the minimum FLA setting of the Multifunction Control Unit in **increments of 10%**. **Default setting is 30% of the minimum FLA setting.** ***Example:*** *The 0.15 to 0.60 Multifunction Control Unit has an adjustable range from 0.03 to 0.75 A in increments of 0.01 A, with a default setting of 0.04 A.*	**Amps**
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

ENGLISH

2-5-4-7 47_PhaseImb (Phase Imbalance / Phase Loss Protection)

⚠ WARNING

Incorrect Phase Imbalance setting

- Phase Imbalance levels must be set to protect wiring and motor equipment,
- Function disabled if configured for 1 phase motor loads,
- Settings must conform to national and local safety regulations and codes.

Disabled or high Trip Level settings can result in death, serious injury, or equipment damage.

Function *(line 1)*		Parameter *(line 2)*	Definition
47_PhaseImb		Trip *(see 2-5-4-7-1, p. 57)*	Enables or disables the **Phase Imbalance / Phase Loss Protection** Trip function. A trip command is initiated if the Multifunction Control Unit detects a continuous current in one phase that differs by more than a set percentage from the average current in all three phases for the set time period. ***NOTE:*** *Fault reset method for this function depends on the reset type selected (see **42_ResetMode**, page 48)*
		TripTimeStrt *(see 2-5-4-7-2, p. 57)*	Sets **Phase Imbalance / Phase Loss Protection** Start Mode Trip Time parameter. The Start Mode Trip Time parameter is defined as the amount of time (in seconds) during the **Run Start Cycle** that the set level of imbalance current is detected before initiating a phase imbalance trip *(see Chapter 3 - , **Run Start Cycle**, page 79).*
		TripTimeRun *(see 2-5-4-7-3, p. 58)*	Sets **Phase Imbalance / Phase Loss Protection** Run Mode Trip Time parameter. The Run Mode Trip Time parameter is defined as the amount of time (in seconds) during the **"Run" mode (settings)** that the set **TripLevel** *(page 58)* of imbalance current is detected before initiating a phase imbalance trip *(see 2-2-3, **"Run" mode (settings)**, page 23).*
		TripLevel *(see 2-5-4-7-4, p. 58)*	Sets **Phase Imbalance / Phase Loss Protection** Trip Level parameter. The Trip Level parameter is defined as the ratio of imbalance current to the average current in all three phases that is detected for the set time period before initiating a phase imbalance trip.

Function *(line 1)*		Parameter *(line 2)*	Definition
(47_PhaseImb)	▲▼	Warning *(see 2-5-4-7-5, p. 58)*	Enables or disables the **Phase Imbalance / Phase Loss Protection** Warning function. If the Multifunction Control Unit detects a phase imbalance condition above the set **Warn Level** *(page 58)*, a warning is actived. The Warning deactivates itself when the imbalance condition drops 5% below the set level.
		Warn Level *(see 2-5-4-7-6, p. 58)*	Sets the Phase Imbalance / Phase loss Warn Level parameter.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display parameters.*		
	ENT : *Sends to parameters settings.*		
	ESC : *Returns to* ***4_AdvSetup*** *(page 45).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the* ***"Run" mode (settings)*** *(page 23), the scrolling display shall resume.*		

2-5-4-7-1 Trip

Parameter *(line 1)*		Setting *(line 2)*	Definition
Trip	▲▼	**= On**	Enables the **Phase Imbalance / Phase Loss Protection** Trip parameter. **Enabled by default.**
		? Off	Disables the **Phase Imbalance / Phase Loss Protection** Trip parameter.
	ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
	ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-7-2 TripTimeStrt

Parameter *(line 1)*		Setting *(line 2)*	Definition	Units
TripTimeStrt	▲▼	**= 0.7 Sec.**	Use ▼ or ▲ to select the desired time. The Trip Time (**Start**) parameter is adjustable from 0.2 to 20 seconds in increments of 0.1 seconds. **Default setting is 0.7 second.** ***NOTE:*** *For configuration of the* ***Run Start Cycle*** *time, see* ***410_LongStrt*** *(page 47).*	**Sec.**
	ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*			
	ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*			

2-5-4-7-3 TripTimeRun

Parameter (line 1)		Setting (line 2)	Definition	Units
TripTimeRun		= 5.0 Sec.	Use ▼ or ▲ to select the desired time. The Trip Time (Run Mode) parameter is adjustable from 0.2 to 20 seconds in increments of 0.1 seconds. **Default setting is 5 seconds.** ***NOTE:*** *For information on the **Run Start Cycle** time, see **410_LongStrt** (page 47).*	**Sec.**
		ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*		
		ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45).*		

2-5-4-7-4 TripLevel

Parameter (line 1)		Setting (line 2)	Definition	Units
TripLevel		= 10% IMB	Use ▼ or ▲ to select the desired level. The Trip Level parameter is adjustable from 10 to 30% Phase imbalance in increments of 1%. **Default setting is 10% IMB.**	**% IMB**
		ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*		
		ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45).*		

2-5-4-7-5 Warning

Parameter (line 1)		Setting (line 2)	Definition
Warning		= On	Enables the Warning parameter. **Enabled by default.**
		? Off	Disables the Warning parameter.
		ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*	
		ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45).*	

2-5-4-7-6 Warn Level

Parameter (line 1)		Setting (line 2)	Definition	Units
Warn Level		= 10% IMB	Use ▼ or ▲ to select the desired level. The Warn Level parameter is adjustable from 10 to 30% phase imbalance in increments of 1%. **Default setting is 10% IMB.**	**% IMB**
		ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*		
		ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45).*		

2-5-4-8 **48_Jam** (Jam Protection)

Function *(line 1)*		Parameter *(line 2)*	Definition
48_Jam		Trip *(see 2-5-4-8-1, p. 59)*	Enables or disables the **Jam Protection** Trip function. A trip command is initiated if the Multifunction Control Unit detects a RMS current that exceeds a set **TripLevel** *(page 60)* for the set **TripTime** *(page 60)* period after the **Run Start Cycle** *(page 79)* has ended. ***NOTE:*** *Fault reset method for this function depends on the reset type selected (see , **42_ResetMode**, page 48)*
	▲▼	TripTime *(see 2-5-4-8-2, p. 60)*	Sets the **Jam Protection** Trip Time parameter. The Trip Time parameter is defined as the amount of time (in seconds) that a set **TripLevel** *(page 60)* of RMS current is detected before initiating a Jam Trip.
		TripLevel *(see 2-5-4-8-3, p. 60)*	Sets the **Jam Protection** Trip Level parameter. The Trip Level parameter is defined as the ratio of RMS current to the FLA setting that is detected for a set **TripTime** *(page 60)* period before initiating a Jam Trip.
		Warning *(see 2-5-4-8-4, p. 60)*	Enables or disables the **Jam Protection** Warning function. A warning will be activated if the Multifunction Control Unit detects a Jam condition above a set **Warn Level** *(page 60)*. The Warning deactivates itself when the Jam condition drops 5% below the set level.
		Warn Level *(see 2-5-4-8-5, p. 60)*	Sets the **Jam Protection** Warn Level parameter.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display parameters.*		
	ENT : *Sends to parameters settings.*		
	ESC : *Returns to **4_AdvSetup** (page 45).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the **"Run" mode (settings)** (page 23), the scrolling display shall resume.*		

2-5-4-8-1 **Trip**

Parameter *(line 1)*		Setting *(line 2)*	Definition
Trip	▲▼	**= Off**	Disables the **Jam Protection** Trip parameter. **Disabled by default.**
		? On	Enables the Jam Trip parameter.
	ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*		
	ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45).*		

2-5-4-8-2 TripTime

Parameter (line 1)		Setting (line 2)	Definition	Units
TripTime	▲▼	= 5 Sec.	Use ▼ or ▲ to select the desired time. The Trip Time parameter is adjustable from 1 to 30 seconds in increments of 1 second. **Default setting is 5 seconds.**	Sec.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-8-3 TripLevel

Parameter (line 1)		Setting (line 2)	Definition	Units
TripLevel	▲▼	= 200% FLA	Use ▼ or ▲ to select the desired level. The Trip Level parameter is adjustable from 100 to 800% of the FLA setting in increments of 10%. **Default setting is 200% FLA.**	% FLA
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-8-4 Warning

Parameter (line 1)		Setting (line 2)	Definition
Warning	▲▼	= Off	Disables the Warning parameter. **Disabled by default.**
		? On	Enables the Warning parameter.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*	
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*	

2-5-4-8-5 Warn Level

Parameter (line 1)		Setting (line 2)	Definition	Units
Warn Level	▲▼	= 200% FLA	Use ▼ or ▲ to select the desired level. The Warn Level parameter is adjustable from 100 to 800% of the FLA setting in increments of 10%. **Default setting is 200% FLA.**	% FLA
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-9 49_UnderLoad (Under Load Protection)

Function *(line 1)*		Parameter *(line 2)*	Definition
49_UnderLoad		Trip *(see 2-5-4-9-1, p. 61)*	Enables or disables the **Under Load Protection** Trip function. A trip command is initiated if the Multifunction Control Unit detects a RMS current below a set **TripLevel** *(p. 62)* for the set **TripTime** *(p. 62)* period after the **Run Start Cycle** *(page 79)* has ended. ***NOTE:*** *Fault reset method for this function depends on the reset type selected (see , **42_ResetMode**, page 48)*
	▲▼	TripTime *(see 2-5-4-9-2, p. 62)*	Sets the **Under Load Protection** Trip Time parameter. The Trip Time parameter is defined as the amount of time (in seconds) that the RMS current is detected below a set value before inititing an **Under Load Protection** Trip.
		TripLevel *(see 2-5-4-9-3, p. 62)*	Sets the **Under Load Protection** Trip Level parameter. The Trip Level parameter is defined as the ratio of RMS current to the FLA setting that is detected for a set time period before initiating an Under Load Trip.
		Warning *(see 2-5-4-9-4, p. 62)*	Enables or disables the **Under Load Protection** Warning function. A warning is actived if the Multifunction Control Unit detects an **Under Load Protection** condition above a set **Warn Level** *(page 62)*. The warning is desactivated when the **Under Load Protection** condition rises 5% above the set level.
		Warn Level *(see 2-5-4-9-5, p. 62)*	Sets the **Under Load Protection** Warn Level parameter.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display parameters.*		
	ENT : *Sends to parameters settings.*		
	ESC : *Returns to **4_AdvSetup** (page 45).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the **"Run" mode (settings)** (page 23), the scrolling display shall resume.*		

2-5-4-9-1 Trip

Parameter *(line 1)*		Setting *(line 2)*	Definition
Trip	▲▼	= Off	Disables the **Under Load Protection** Trip parameter **Disabled by default.**
		? On	Enables the **Under Load Protection** Trip parameter.
	ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*		
	ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45).*		

ENGLISH

2-5-4-9-2 TripTime

Parameter (line 1)		Setting (line 2)	Definition	Units
TripTime		**= 10 Sec.**	Use ▼ or ▲ to select the desired time. The Trip Time parameter is adjustable from 1 to 200 seconds in increments of 1 second. **Default setting is 10 seconds.**	**Sec.**
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-9-3 TripLevel

Parameter (line 1)		Setting (line 2)	Definition	Units
TripLevel		**= 50% FLA**	Use ▼ or ▲ to select the desired level. The Trip Level parameter is adjustable from 30 to 100% of the FLA setting in increments of 1%. **Default setting is 50% FLA.**	**% FLA**
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-9-4 Warning

Parameter (line 1)		Setting (line 2)	Definition
Warning		**= Off**	Disables the Warning parameter. **Disabled by default.**
		? On	Enables the Warning parameter.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*	
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*	

2-5-4-9-5 Warn Level

Parameter (line 1)		Setting (line 2)	Definition	Units
Warn Level		**= 50% FLA**	Use ▼ or ▲ to select the desired level. The Warn Level parameter is adjustable from 30 to 100% of the FLA setting in increments of 1%. **Default setting is 50% FLA.**	**% FLA**
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-10 **410_LongStrt** (Long Start Protection)

Function *(line 1)*		Parameter *(line 2)*	Definition
410_LongStrt		Trip *(see 2-5-4-10-1, p. 63)*	Enables or disables the **Long Start Protection** Trip function. A trip command is initiated during the **Run Start Cycle** A trip command is initiated if the Multifunction Control Unit detects a RMS current that exceed a set **TripLevel** *(page 64)* when the **Run Start Cycle** *(page 79)* has ended. ***NOTE:*** *Fault reset method for this function depends on the reset type selected (see , **42_ResetMode**, page 48)*
	▲▼	TripTime *(see 2-5-4-10-2, p. 64)*	Sets the **Long Start Protection** Trip Time parameter. The Long Start Trip Time parameter is defined as the maximum length (in seconds) of the **Run Start Cycle** *(page 79)* during a Long Start Fault condition.
		TripLevel *(see 2-5-4-10-3, p. 64)*	Sets the **Long Start Protection** Trip Level parameter. The Long Start Trip Level parameter is defined as the ratio of RMS current to the FLA setting that is detected as the **Run Start Cycle** *(page 79)* expires before initiating a Long Start Trip.
		Warning *(see 2-5-4-10-4, p. 64)*	Enables or disables the **Long Start Protection** Warning function. A warning is actived if the Multifunction Control Unit detects a Long Start condition above a set **Warn Level** *(page 64)* before the **Run Start Cycle** *(page 79)* has ended. The warning is desactivated when the Run Start condition drops 5% below the set **TripLevel** *(p. 64)* or if the **Run Start Cycle** *(page 79)* ends.
		Warn Level *(see 2-5-4-10-5, p. 64)*	Sets the **Long Start Protection** Warn Level parameter.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display parameters.*		
	ENT : *Sends to parameters settings.*		
	ESC : *Returns to **4_AdvSetup** (page 45).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the **"Run" mode (settings)** (page 23), the scrolling display shall resume.*		

2-5-4-10-1 **Trip**

Parameter *(line 1)*		Setting *(line 2)*	Definition
Trip	▲▼	= Off	Disables the **Long Start Protection** Trip parameter. **Disabled by default.**
		? On	Enables the **Long Start Protection** Trip parameter.
	ENT : *Saves setting and returns to **4_AdvSetup** (page 45).*		
	ESC : *Does not save a setting, returns to **4_AdvSetup** (page 45)*		

2-5-4-10-2 TripTime

Parameter (line 1)		Setting (line 2)	Definition	Units
TripTime	▲▼	= 10 Sec.	Use ▼ or ▲ to select the desired time. The Trip Time parameter is adjustable from 1 to 200 seconds in increments of 1 second. **Default setting is 10 seconds.**	Sec.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-10-3 TripLevel

Parameter (line 1)		Setting (line 2)	Definition	Units
TripLevel	▲▼	= 100% FLA	Use ▼ or ▲ to select the desired level. The Trip Level parameter is adjustable from 100 to 800% of the FLA setting in increments of 10%. **Default setting is 100% FLA.**	% FLA
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-4-10-4 Warning

Parameter (line 1)		Setting (line 2)	Definition
Warning	▲▼	= Off	Disables the Warning parameter. **Disabled by default.**
		? On	Enables the Warning parameter.
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*	
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*	

2-5-4-10-5 Warn Level

Parameter (line 1)		Setting (line 2)	Definition	Units
Warn Level	▲▼	= 100% FLA	Use ▼ or ▲ to select the desired level. The Warn Level parameter is adjustable from 100 to 800% of the FLA setting in increments of 10%. **Default setting is 100% FLA.**	% FLA
		ENT : *Saves setting and returns to* ***4_AdvSetup*** *(page 45).*		
		ESC : *Does not save a setting, returns to* ***4_AdvSetup*** *(page 45).*		

2-5-5 5_CommSetup

- The **5_CommSetup** submenu allows access to the controls of the RS 485 serial port (compatible with Modbus® protocol) on the front face of the Multifunction Control Unit.
- The RS 485 asynchronous interface supports the Modbus® RTU slave protocol.
- Remote display or configuration devices must be Modbus® RTU masters which initiate communications by reading and writing 16 bits register data in the Multifunction Control Unit. See Appendix C - **Register data format** *(page 86)*.
- See 1-3-6-4 **RS 485 Serial port RJ-45 connector** *(page 19)*.
- For detailed information, on the Modbus® protocol, see <www.modbus.org>.

⚠ WARNING

Improper communication port usage

- Communication ports should be used for non-critical data transfers only,
- Monitoring of contactor status and current levels are delayed by transmission time and should not be used for critical control decisions,
- Functions such as **ShuntTrip**, and **Pause** should not be used for emergency or critical control applications.

Improper use of Communication Ports can result in death, serious injury, or equipment damage.

Submenu *(line 1)*		Function *(line 2)*	Definition
5_CommSetup		51_Drop *(see 2-5-5-1, p. 66)*	Sets the RS 485 serial port Drop parameter. The Drop parameter is defined as the configurable Modbus® slave number for the external RS 485 serial port.
	▲ ▼	52_Baud *(see 2-5-5-2, p. 67)*	Sets the RS 485 serial port Baud rate parameter. The Baud rate parameter defines the speed at which the Multifunction Control Unit can communicate with an external Modbus® device.
		53_Parity *(see 2-5-5-3, p. 67)*	Sets the asynchronous protocol parity for the external RS 485 serial port.

ENGLISH

Submenu *(line 1)*		Function *(line 2)*	Definition
(5_CommSetup)	▲▼	54_Control *(see 2-5-5-4, p. 67)*	Enables or disables write access by remote configuration devices through the external RS 485 serial port. If this function is disabled, changes to the protection settings via the external RS 485 serial port can not be made. Write commands to the following registers are always possible and not affected. - Remote keypad (register 1100) - Multifunction Control Units state control (register 704) - Multifunction Control Units extended state control (register 705) - Option module configuration (registers 680-690) - Private registers above 20000 ***NOTE:*** *Write commands are disabled while the Multifunction Control Unit is in the* **"Run" mode (monitoring)** *(page 24) except for writes to the* ***31_FLASet*** *(page 42) Setting (register 653) and the list of* ***" - always enabled - "*** *registers above.* *Changes to configuration registers 600 through 626 are disabled while keypad changes are in process.*
		55_CommLoss *(see 2-5-5-5, p. 68)*	Enables or disables the external RS 485 serial port watchdog. A CommLoss fault is defined as any inactive period longer than 5 seconds. A start delay of 10 seconds follows each time coil control power is applied to the A1, A2 terminals.
	NOTE: *Press ▼ or ▲ to enable stepping through all the display functions.*		
	ENT : *Sends to functions settings.*		
	ESC : *Returns to* ***Main Menu*** *(page 35).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the* ***"Run" mode (settings)*** *(page 23), the scrolling display shall resume.*		

2-5-5-1 **51_Drop** (Modbus® Slave Number)

Function *(line 1)*		Setting *(line 2)*	Definition
51_Drop	▲▼	= 1	Use ▼ or ▲ to select the desired **Modbus® Slave Number** can be selected. The **Modbus® Slave Number** parameter is selectable from 1 to 247. **Default setting is 1.**
	ENT : *Saves setting and returns to* ***5_CommSetup*** *(page 65).*		
	ESC : *Does not save a setting, returns to* ***5_CommSetup*** *(page 65).*		

2-5-5-2 52_Baud (Modbus® Baud Rate)

Function *(line 1)*		Setting *(line 2)*	Definition	Units
52_Baud	▲ ▼	= 19200 bps	Sets the **Modbus® Baud Rate** parameter to 19200 bps. **Enabled by default.**	**bps**
		? 9600	Sets the **Modbus® Baud Rate** parameter to 9600 bps.	
		? 4800	Sets the **Modbus® Baud Rate** parameter to 4800 bps.	
		? 1200	Sets the **Modbus® Baud Rate** parameter to 1200 bps.	
		ENT : *Saves setting and returns to* ***5_CommSetup*** *(page 65).*		
		ESC : *Does not save a setting, returns to* ***5_CommSetup*** *(page 65).*		

2-5-5-3 53_Parity (Asynchronous Protocol Parity)

Function *(line 1)*		Setting *(line 2)*	Definition
53_Parity	▲ ▼	= None	Sets the **Asynchronous Protocol Parity** parameter to None. (1 start bit, 8 data bits, and 1 stop bit). **Enabled by default.**
		? Even	Sets the **Asynchronous Protocol Parity** parameter to Even. (1 start bit, 8 data bits, even parity, and 1 stop bit).
		ENT : *Saves setting and returns to* ***5_CommSetup*** *(page 65).*	
		ESC : *Does not save a setting, returns to* ***5_CommSetup*** *(page 65).*	

2-5-5-4 54_Control (Write Control)

Function *(line 1)*		Setting *(line 2)*	Definition
54_Control	▲ ▼	= On	Enables the **Write Control** parameter allowing write commands. **Enabled by default.**
		? Off	Disables the **Write Control** parameter.
		ENT : *Saves setting and returns to* ***5_CommSetup*** *(page 65).*	
		ESC : *Does not save a setting, returns to* ***5_CommSetup*** *(page 65).*	

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2-5-5-5 **55_CommLoss** (Communication Loss protection)

Function *(line 1)*		Setting *(line 2)*	Definition
55_CommLoss		**= Ignore**	Disables the **Communication Loss protection** parameter. **Enabled by default.**
		? Dropout	Enables the **Communication Loss protection** Dropout setting. Upon detecting a **Communication Loss protection** fault, the Multifunction Control Unit causes the contactor coil to de-energize without tripping the Power Base mechanism. To reset the fault, press the **ENT** key on the keypad or send a reset command via the external RS 485 serial port. (Register 704-bit 3).
		? Trip	Enables the **Communication Loss protection** Trip setting. Upon detecting a **Communication Loss protection** fault, the Multifunction Control Unit causes a trip of the Power Base mechanism. This requires a **Manual Reset** of the Power Base mechanism
		? Warning	Enables the **Communication Loss protection** warning setting. Upon detecting a **Communication Loss protection** fault, the Multifunction Control Unit activates a warning. The warning is deactivated when the communication is again established with the Multifunction Control Unit.
		ENT : *Saves setting and returns to* ***5_CommSetup*** *(page 65).*	
		ESC : *Does not save a setting, returns to* ***5_CommSetup*** *(page 65).*	

2-5-6 6_Module

- The **6_Module** submenu allows for the configuration of option modules that can Read and Write into the Multifunction Control Unit data registers.
- Configuration of these option modules can be made by entering parameter codes with the keypad or by a remote configuration device connected to the RS 485 serial communication port *(see 1-3-6-4, **RS 485 Serial port RJ-45 connector**, page 19).*
- See individual option module instructions for parameter code definitions.

Submenu *(line 1)*		Function *(line 2)*	Definition
6_Module		61_ID Clear *(see 2-5-6-1, p. 69)*	Allows user to reset the option module identification back to 0, disabling the watchdog function. *(see **Fault code summary**, page 96).*
		62_Reference *(see 2-5-6-2, p. 70)*	Displays option module references as they are written to the Multifunction Control Unit by the option module.
	▲ ▼	63_Id Set *(see 2-5-6-3, p. 70)*	Set the option module identification into the Multifunction Control Unit so as to provide watchdog and configuration functions.
		64_Param dec *(see 2-5-6-4, p. 70)*	Allows entering option module parameter codes in Decimal. **NOTE:** *This function sets the same parameters as found in **65_Param hex**.*
		65_Param hex *(see 2-5-6-5, p. 71)*	Allows entering option module parameter codes in Hex. **NOTE:** *This function sets the same parameters as found in **64_Param dec**.*
	NOTE: *Press ▼ or ▲ to enable stepping through all the display functions.*		
	***ENT :** Sends to functions settings.*		
	***ESC :** Returns to **Main Menu** (page 35).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the **"Run" mode (settings)** (page 23), the scrolling display shall resume.*		

2-5-6-1 61_ID Clear (Option Module Identification Number Reset)

Function *(line 1)*		Setting *(line 2)*	Definition
61_ID Clear	▲ ▼	**= Yes**	Resets option module identification number to 0 (zero). **Enabled by default.**
		= No	Disables option module identification number reset.
	***ENT :** Saves setting and returns to **3_Setup** (page 41).*		
	***ESC :** Does not save a setting, returns to **3_Setup** (page 41).*		

2-5-6-2 62_Reference (Option Module References)

Submenu Function *(line 1, line 2)*			Parameter Reference *(line 1, line 2)*	Definition
(6_Module) 62_Reference	ENT	▲▼	Module **ID = 0**	Option module ID code is displayed in line 2. "**ID = 0**" indicates unknown or no option module present
		▲▼	Catalog **?**	Option module Catalog number is displayed in line 2. If ID code is 0 Catalog number is displayed as "**?**".
			Firmware **Rev: 0.00**	Option module Firmware revision is displayed in line 2. If ID code is 0 Firmware revision is displayed as "**0.00**".
	ENT : *Sends to parameters settings.*			
	NOTE: *Press ▼ or ▲ to enable stepping through all the display parameters.*			
	ESC : *Returns to* ***6_Module*** *(page 69).*			

2-5-6-3 63_Id Set (Option Module Identification number)

Function *(line 1)*		Setting *(line 2)*	Definition
63_Id Set	▲▼	**= 0**	Use ▼ or ▲ to select the desired option module ID number. The ID set parameter is settable from 0 to 149. **Default setting is 0**
	ENT : *Saves setting and returns to* ***6_Module*** *(page 69).*		
	ESC : *Does not save a setting, returns to* ***6_Module*** *(page 69).*		

2-5-6-4 64_Param dec (Option Module Parameter Dec setting)

Submenu Function *(line 1, line 2)*			Parameter Reference *(line 1, line 2)*	Definition
(6_Module) 64_Param dec	ENT	▲▼	Parameter 1-16 **= 00000** *(see § 2-5-6-6)*	Line 1 shows the parameter number (1 through 16) Line 2 shows the parameter setting in decimal. The parameters are settable from 00000 to 65535. **Default setting, for all 16 parameters, is 00000**
	ENT : *Sends to parameters settings.*			
	NOTE: *Press ▼ or ▲ to enable stepping through all the parameters numbers.*			
	ESC : *Returns to* ***6_Module*** *(page 69).*			

2-5-6-5 65_Param hex (Option Module Parameter Hex setting)

Submenu Function *(line 1, line 2)*			Parameter Reference *(line 1, line 2)*	Definition
(6_Module) 65_Param hex	ENT	▲ ▼	Parameter 1-16 = 0000 *(see § 2-5-6-6)*	Line 1 shows the parameter number (1 through 16) Line 2 shows the parameter setting in Hex. The parameters are settable from 0000 to FFFF. **Default setting, for all 16 parameters, is 0000**
	ENT : *Sends to parameters settings.*			
	NOTE: *Press ▼ or ▲ to enable stepping through all the parameters numbers.*			
	ESC : *Returns to* ***6_Module*** *(page 69).*			

2-5-6-6 Parameter 1-16 (Option Module Parameter setting)

Parameter *(line 1)*	Setting *(line 2)*	Definition
Setting of parameters codes 1 to 16 can be done in either decimal or hex		
	= 00000 ENT	• Press the **ENT** key to begin parameters setting.
Parameter 1 (**Decimal**)	= 00000 0_ _ _ _	<=== First digit of the parameter 1 (decimal)
	▲ = 00000 1_ _ _ _ ▲ ▲ ▲ ▲ = 00000 5_ _ _ _	• Press ▼ or ▲ to increment the first digit. (0 to 6) ***NOTE:*** *See individual option module instruction sheets for code definitions.*
	ENT = 50000 _0 _ _ _	• Press the **ENT** key to enter the first value and send to the second digit.
	= 50000 _0 _ _ _ ▲ ▲ ▲ = 50000 _3 _ _ _ ENT = 53000 _ _0 _ _	• The same procedure is followed for the remaining digits. ***NOTE:*** *In the decimal mode the Multifunction Control Unit will not allow a digit to scroll past the 65535 maximum value.* • Press the **ENT** key to enter the second value and send to the third digit.
	= 53210 _ _ _ _4 ENT = 53214	• When the last digit value has been selected and the **ENT** key pressed, the parameter code will be set.
Parameter 2 - 16 (Decimal)	= 00000 ENT = 00000 0_ _ _ _	***NOTE:*** *Setting of parameter 2 to 16, follows the same procedure.*

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Parameter 1 (**hex**)	= 0000 0_ _ _ ▲ = 0000 1_ _ _ ▲ x 14 = 0000 F_ _ _ ENT = F000 _0 _ _	<=== First digit of the parameter 1 (hex) • Press ▼ or ▲ to increment the first digit. (0 to F) ***NOTE:*** *See individual option module instruction sheets for code definitions.* • Press the **ENT** key to enter the first value and send to the second digit.
	= F240 _ _ _ B ENT = F24B	• When the last digit valve has been selected and the **ENT** key pressed, the parameter code will be set.
Parameter 2 - 16 (hex)	= 0000	***NOTE:*** *Setting of parameter 2 to 16, follows the same procedure.*

	ENT : *Saves setting and returns to* ***6_Module*** *(page 69).*
	ESC : *Does not save a setting, returns to* ***6_Module*** *(page 69).*

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2-5-7 7_Statistics

- The **7_Statistics** submenu allows access to the Fault history stored in the Multifunction Control Unit memory.
- The Multifunction Control Unit stores information on the last 5 Faults as well as Fault and Run history totals.

  NOTE: *Internal Fault Trips are not displayed in last 5 faults.*
- Enabling the **83_Rst Stats** *(page 76)* function clears all stored statistics data.
- The Fault history can be accessed during the **"Run" mode (settings)** *(page 23)* or **"Config" mode (first power-up: configuration and settings)** *(page 21)* or **"Off", "Ready" and "Pause" modes (subsequent power-ups and settings)** *(page 22)*.

Submenu *(line 1)*		Function *(line 2)*	Definition
7_Statistics	▲▼	71_Trip0 *(see 2-5-7-1, p. 73)*	Contains stored **Historical Information (Last fault)** detected.
		72_Trip1 *(see 2-5-7-2, p. 74)*	Contains stored **Historical Information (Second to last fault)** detected.
		73_Trip2 *(see 2-5-7-3, p. 74)*	Contains stored **Historical Information (Third to last fault)** detected.
		74_Trip3 *(see 2-5-7-4, p. 74)*	Contains stored **Historical Information (Fourth to last fault)** detected.
		75_Trip4 *(see 2-5-7-5, p. 75)*	Contains stored **Historical Information (Fifth to last fault)** detected.
		76_Totals *(see 2-5-7-6, p. 75)*	Contains **Historical Count Totals for Start, Run and Fault Events** as detected by the Multifunction Control Unit. ***NOTE:*** *Press the* **ENT** *key to view the Totals item in first line and the actual count in the second line.*
	NOTE: *Press ▼ or ▲ to enable stepping through all functions.*		
	ENT : *Sends to function.*		
	ESC : *Returns to* ***Main Menu*** *(page 35).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the* ***"Run" mode (settings)*** *(page 23), the scrolling display shall resume.*		

2-5-7-1 71_Trip0 (Historical Information (Last fault))

Function *(line 1)*		Value *(line 2)*	Definition	Units
71_Trip0	▲▼	**Type=xxxxxxx**	The Type=xxxxxxx Statistics Item shows the type of fault detected. See Appendix B - **Display Words** *(page 84)* for fault types.	-
		FLA= xxx A	The FLA = xxx A Statistics Item shows setting of the **31_FLASet** *(page 41)* function in Amps([5]).	**Amps**
		Therm= xxx%	The Therm = xxx% Statistics Item shows the thermal capacity in % of thermal capacity used.	**% FLA**

Function *(line 1)*		Value *(line 2)*	Definition	Units
(71_Trip0)	▲▼	**IAV= xxx A**	The IAV = xxx A Statistics Item shows the average current in amps as measure by the Multifunction Control Unit(5).	**Amps**
		IL1= xxx A	The IL1 = xxx A Statistics Item shows the L1 current in amps as measure by the Multifunction Control Unit(5).	**Amps**
		IL2= xxx A	The IL2 = xxx A Statistics Item shows the L2 current in amps as measure by the Multifunction Control Unit(5).	**Amps**
		IL3= xxx A	The IL3 = xxx A Statistics Item shows the L3 current in amps as measure by the Multifunction Control Unit(5).	**Amps**
		IGR= xxx A	The IGR = xxx A Statistics Item shows the ground fault current in amps as measure by the Multifunction Control Unit(5).	**Amps**
	NOTE: *Press ▼ or ▲ to enable stepping through all values.*			
	ESC : *Returns to* ***7_Statistics*** *(page 73).*			
			(5) when the fault is detected	

2-5-7-2 **72_Trip1** (Historical Information (Second to last fault))

Function *(line 1)*		Value *(line 2)*	Definition
72_Trip1	▲▼	The items found under this function are identical to those found under **71_Trip0** *(page 73).*	
	NOTE: *Press ▼ or ▲ to enable stepping through all functions.*		
		ESC : *Returns to* ***7_Statistics*** *(page 73).*	

2-5-7-3 **73_Trip2** (Historical Information (Third to last fault))

Function *(line 1)*		Value *(line 2)*	Definition
73_Trip2	▲▼	The items found under this function are identical to those found under **71_Trip0** *(page 73).*	
	NOTE: *Press ▼ or ▲ to enable stepping through all functions.*		
		ESC : *Returns to* ***7_Statistics*** *(page 73).*	

2-5-7-4 **74_Trip3** (Historical Information (Fourth to last fault))

Function *(line 1)*		Value *(line 2)*	Definition
74_Trip3	▲▼	The items found under this function are identical to those found under **71_Trip0** *(page 73).*	
	NOTE: *Press ▼ or ▲ to enable stepping through all functions.*		
		ESC : *Returns to* ***7_Statistics*** *(page 73).*	

2-5-7-5 **75_Trip4** (Historical Information (Fifth to last fault))

Function *(line 1)*		Value *(line 2)*	Definition
75_Trip4	▲▼	The items found under this function are identical to those found under **71_Trip0** *(page 73)*.	
		NOTE: *Press ▼ or ▲ to enable stepping through all functions.*	
		ESC : *Returns to* ***7_Statistics*** *(page 73).*	

2-5-7-6 **76_Totals** (Historical Count Totals for Start, Run and Fault Events)

Function *(line 1)*		Value *(line 2)*	Definition
76_Totals		**Total Starts**	Contains the total number of motor starts detected. A start is defined as closure of the power contacts.
		Auto Resets	Contains the total number of Auto Resets detected.
		Shunt Trips	Contains the total number of Shunt Trips detected.
		ON Hours	Contains the total number of Hours that the Power Base contacts have been closed.
		SC Trips	Contains the total number of Short Circuit Trips detected.
		Mag Trips	Contains the total number of Magnetic Fault Trips detected.
		OL Trips	Contains the total number of OverLoad Faults detected.
		GF Trips	Contains the total number of Ground Fault Trips detected.
	▲	**Imbal Trips**	Contains the total number of Phase Loss and Phase Imbalance faults detected.
	▼	**Jam Trips**	Contains the total number of Jam faults detected.
		UndrLd Trips	Contains the total number of UnderLoad faults detected.
		LongSt Trips	Contains the total number of Long Start faults detected.
		Comm Trips	Contains the total number of RS 485 serial port Communication Loss faults detected.
		Int Flt	Contains the total number of Internal Multifunction Control Unit Faults detected.
		Warn-OL	Contains the total number of Overload Warnings detected.
		Mod ID	Contains the total number of Option Module ID detection Faults (ex. incorrect or missing module).
		Mod Int	Contains the total number of Option Module Internal Faults.
		Mod Trp	Contains the total number of Option Module Fault Trips detected.
		Mod Drp	Contains the total number of Option Module Fault Dropouts detected.
		NOTE: *Press ▼ or ▲ to enable stepping through all functions.*	
		ESC : *Returns to* ***7_Statistics*** *(page 73).*	

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2-5-8 8_Password

- The **8_Password** submenu allows Password protection that prevents unauthorized access to the Multifunction Control Unit configuration.
- The factory default password of **0000** disables the password feature.
- The range for the password is from **0001** to **9999**.
- This submenu also contains the functions that resets the configurable functions and statistics information back to factory settings.

Submenu *(line 1)*		Function *(line 2)*	Definition
8_Password		81_Unlock *(see 2-5-8-1, p. 77)*	Disables the password protection function. If the password function **82_Lock** *(page 76)* is enabled, it must be disabled before changes to the Multifunction Control Unit settings can be made. ***NOTE:*** *The Multifunction Control Unit display prompts you to enter the password if you try to change a setting with the password enabled.* Once unlocked, the password feature is only temporarily disabled until one of the following events occurs: • The **ESC** key is pressed while at the **Main Menu** *(page 35)*, the Keypad is inactive for more than 15 seconds, coil control power is applied, or both coil control and auxiliary control power are removed. • Changes via the external Modbus® RS 485 serial ports are inhibited while changing functions from the Keypad.
		82_Lock *(see 2-5-8-2, p. 78)*	Enables the password protection function in the Multifunction Control Unit. The default password of **0000** completely disables the password feature. ***NOTE:*** *The password value can be changed via the external Modbus® RS 485 and internal Option Module serial ports, only if the current password is zero (disabled).*
		83_Rst Stats *(see 2-5-8-3, p. 78)*	Resets all Statistics and Fault history values to 0. *(see **7_Statistics**, page 73).* ***NOTE:*** *Statistics values cannot be recovered after RstStats function is enabled.* *External programming devices can be used to save or download the Multifunction Control Unit statistics values.*

Submenu *(line 1)*		Function *(line 2)*	Definition
(8_Password)	▲▼	84_RstToDfts *(see 2-5-8-4, p. 78)*	Resets Multifunction Control Unit back to factory default settings. Enabling this function sends user back to the **Config Menu** *(page 27)*. **This function reset the Statistics values (0)** *(see **83_Rst Stats**, page 76)*. ***NOTE:*** *Function settings can not be recovered once the **84_RstToDfts** (page 78) function has been enabled.* *External programming devices can be used to save or download the Multifunction Control Unit function settings.*
	NOTE: *Press ▼ or ▲ to enable stepping through all the display functions.*		
	ENT : *Sends to functions settings.*		
	ESC : *Returns to **Main Menu** (page 35).*		
	NOTE: *If no key is depressed for a period of 20 seconds while in the **"Run" mode (settings)** (page 23), the scrolling display shall resume.*		

2-5-8-1 **81_Unlock** (Disable Password Protection)

Function *(line 1)*		Setting *(line 2)*	Definition
81_Unlock	▲▼	**Passwd?** (0001 - 9999)	The **Disable Password Protection** function initiates the unlock sequence. The Multifunction Control Unit displays **Passwd?**. • Use ▼ or ▲ to increment the first digit from 0 to 9. • Press the **ENT** key to enter the first value and move to the second digit. • The same procedure is followed for the second, third and fourth digits. • Once the fourth and last digit has been selected and the **ENT** key is pressed, a setting can be modified. ***NOTE:*** *The **Disable Password Protection** function only disables the password feature temporarily.* *The password must be set at **0000** to completely disable the password.*
	ENT : *Saves setting and returns to **8_Password** (page 76).*		
	ESC : *Does not save a setting, returns to **8_Password** (page 76).*		

2-5-8-2 **82_Lock** (Enable Password Protection)

Function *(line 1)*		Setting *(line 2)*	Definition
82_Lock		**NewPSW?** (0001 - 9999)	The **Enable Password Protection** function initiates the lock sequence. The Multifunction Control Unit displays **NewPSW?**. • Use ▼ or ▲ to increment the first digit from 0 to 9. • Press the **ENT** key to enter the first value and move to the second digit. • The same procedure is followed for the second, third and fourth digits. • Once the fourth and last digit has been selected and the **ENT** key is pressed: ==> the Multifunction Control Unit displays shows **Confirm••••**. • You must then reenter the four values as before.
		ENT : *Upon finishing the reentry of the password value, the display quickly shows Done and then returns to* ***8_Password*** *(page 76).*	
		ESC : *Does not save a setting, returns to* ***8_Password*** *(page 76).*	

2-5-8-3 **83_Rst Stats** (Resets the Statistics)

Function *(line 1)*		Setting *(line 2)*	Definition
83_Rst Stats		**= No**	Disables the **Resets the Statistics** function. **Disabled by default.**
		? Yes	Enables the **Resets the Statistics** function clearing all statistics.
		ENT : *Saves setting and returns to* ***8_Password*** *(page 76).*	
		ESC : *Does not save a setting, returns to* ***8_Password*** *(page 76).*	

2-5-8-4 **84_RstToDfts** (Resets all Configurable Functions to factory default settings)

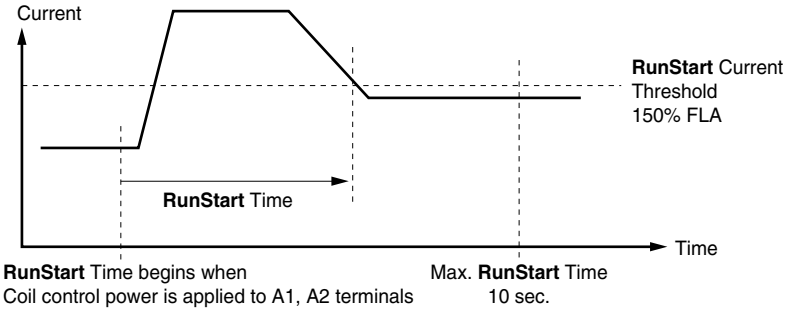
Function *(line 1)*		Setting *(line 2)*	Definition
84_RstToDfts		**= No**	Disables the **Resets all Configurable Functions to factory default settings** function. **Disabled by default.**
		? Yes	Enables the **Resets all Configurable Functions to factory default settings** function clearing all settings.
		ENT : *Saves setting and returns to* ***8_Password*** *(page 76).*	
		ESC : *Does not save a setting, returns to* ***8_Password*** *(page 76).*	

Chapter 3 - Run Start Cycle

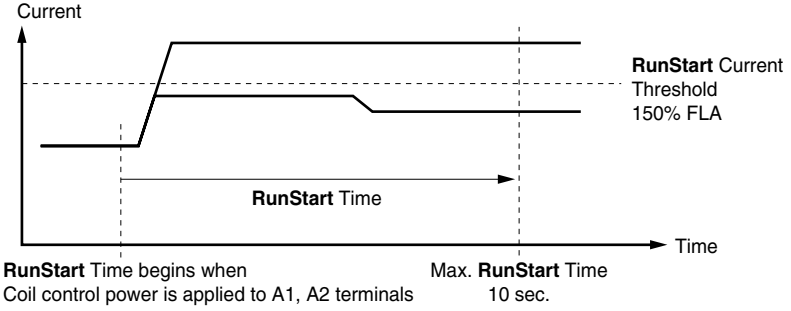
- The **Run Start Cycle** is the period of time allowed for a motor to reach its normal full load current level after starting.
- This cycle time, which is adjustable in the **410_LongStrt** *(page 47)* function, is used to set the start delays for the **48_Jam**, **49_UnderLoad** and **47_PhaseImb** protection functions.

  NOTE: *The **410_LongStrt** (page 47) function will not override the thermal overload protection. If the Multifunction Control Unit reaches the limit of its thermal capacity during the **Run Start Cycle**, the device trips on a thermal overload fault.*
- The length of the **Run Start Cycle** is determined by one of five methods as described below:

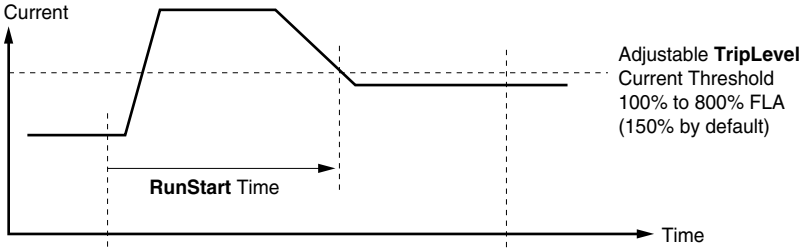
1) The time period from when coil control power is applied to A1, A2 terminals on the Power Base, until the motor load current drops below the 150% FLA current threshold:
- with the ***410_LongStrt*** *(page 47)* function **Trip** or **Warning** parameter " **- Disabled -** ".
- for currents that exceed 150% FLA current threshold.



2) A time period of 10 seconds that starts when coil control power is applied to A1, A2 terminals on the Power Base:
- with the ***410_LongStrt*** *(page 47)* function **Trip** or **Warning** parameter " **- Disabled -** ".
- for currents that continuously exceed 150% FLA current threshold.
- for currents that never exceed 150% FLA current threshold.



3) The time period from when coil control power is applied to A1, A2 terminals on the Power Base, until the motor load current drops below an adjustable **TripLevel** current threshold:
- with the ***410_LongStrt*** *(page 47)* function **Trip** or **Warning** parameter " **- Enabled -** ".
- for currents that exceed the adjustable **TripLevel** current threshold.

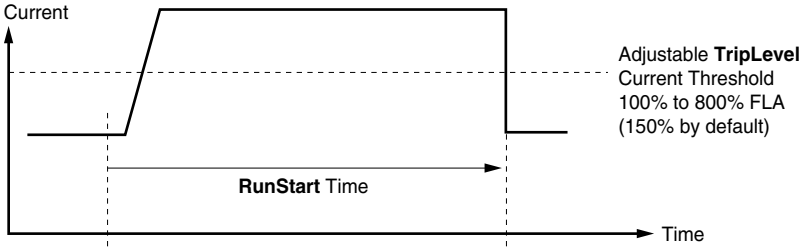


RunStart Time begins when
Coil control power is applied to A1, A2 terminals

Adjustable **TripTime**
1 to 200 sec. (10 sec. by default)

4) An adjustable **TripTime** period that starts when coil control power is applied to A1, A2 terminals on the Power Base:
- with the ***410_LongStrt*** *(page 47)* function **Trip** or **Warning** parameter " **- Enabled -** ".
- for currents that continuously exceed the adjustable **TripLevel** current threshold.

NOTE: *Under this condition, the device will initiate a **Trip** or **Warning** at the end of this **Run Start Cycle**.*

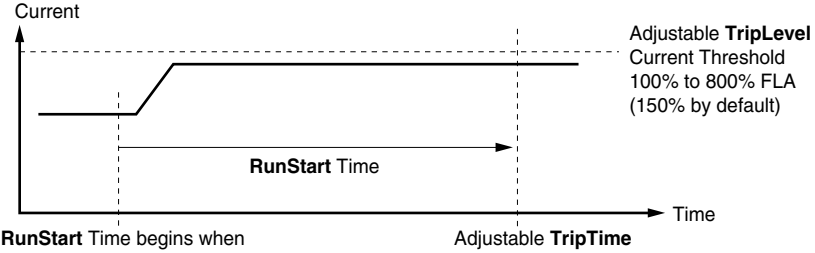


RunStart Time begins when
Coil control power is applied to A1, A2 terminals

Adjustable **TripTime**
1 to 200 sec. (10 sec. by default)

5) An adjustable **TripTime** period that starts when coil control power is applied to A1, A2 terminals on the Power Base:
- with the ***410_LongStrt*** *(page 47)* function **Trip** or **Warning** parameter " **- Enabled -** ".
- for currents that never exceed the adjustable **TripLevel** current threshold.

NOTE: *Under this condition, the device will not initiate a **Trip** or **Warning** at the end of this **Run Start Cycle**.*

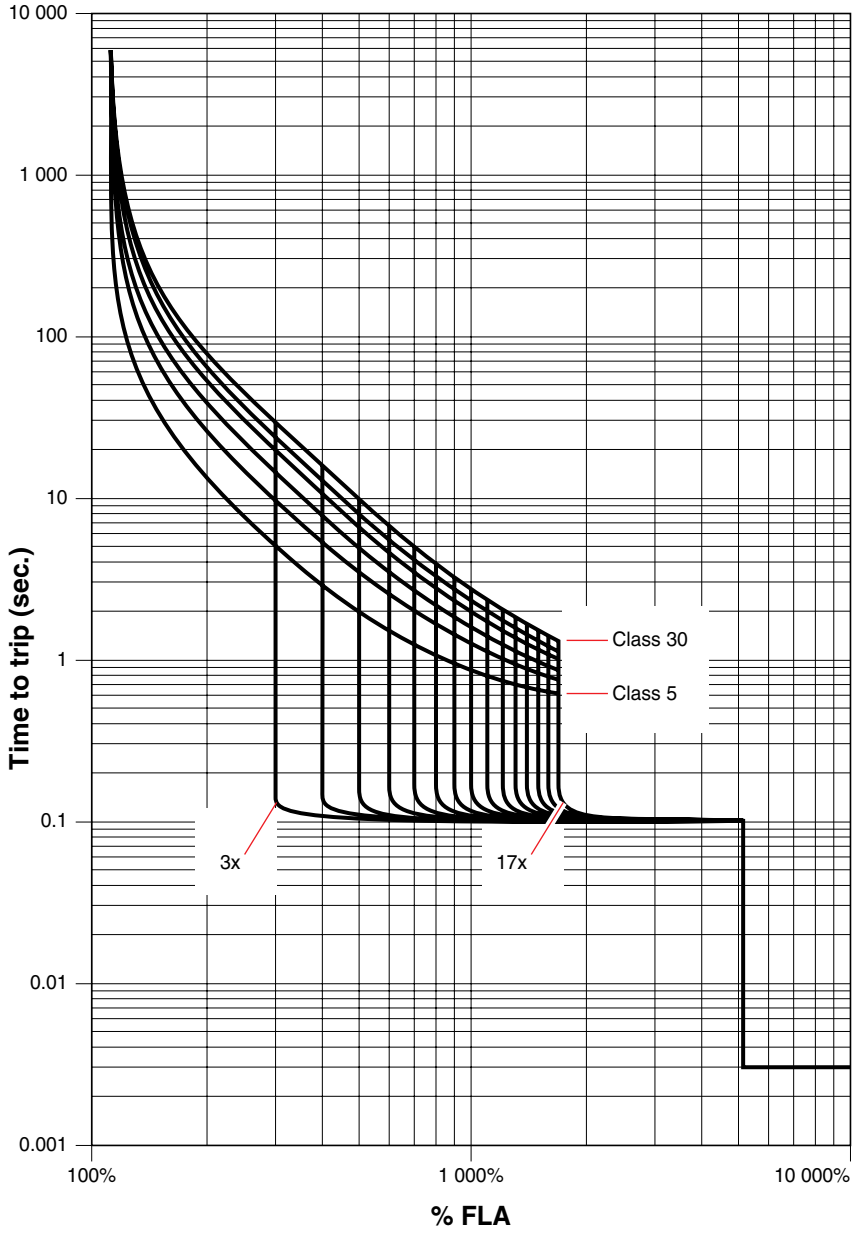


RunStart Time begins when
Coil control power is applied to A1, A2 terminals

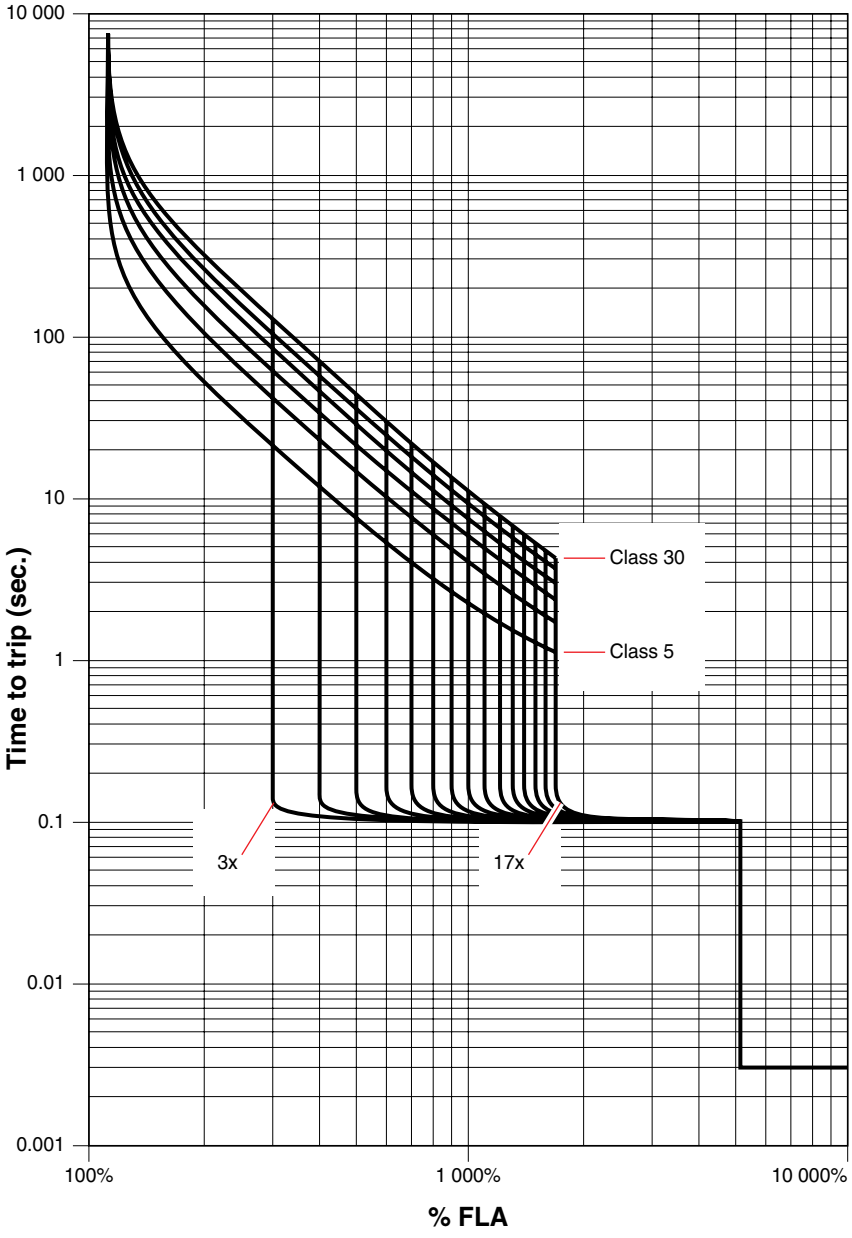
Adjustable **TripTime**
1 to 200 sec. (10 sec. by default)

Appendix A - Thermal Trip and Reset curves

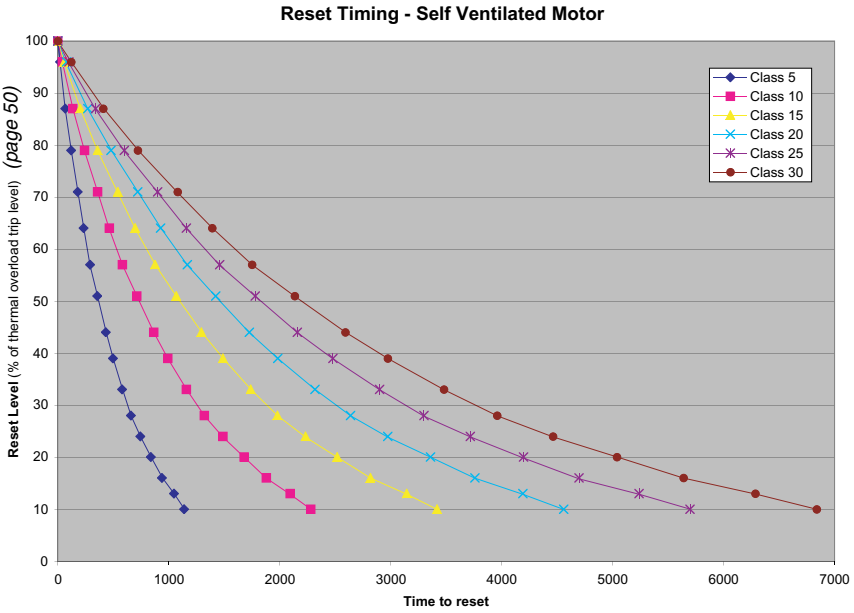
A-1 Trip Times (Hot Motor Load)



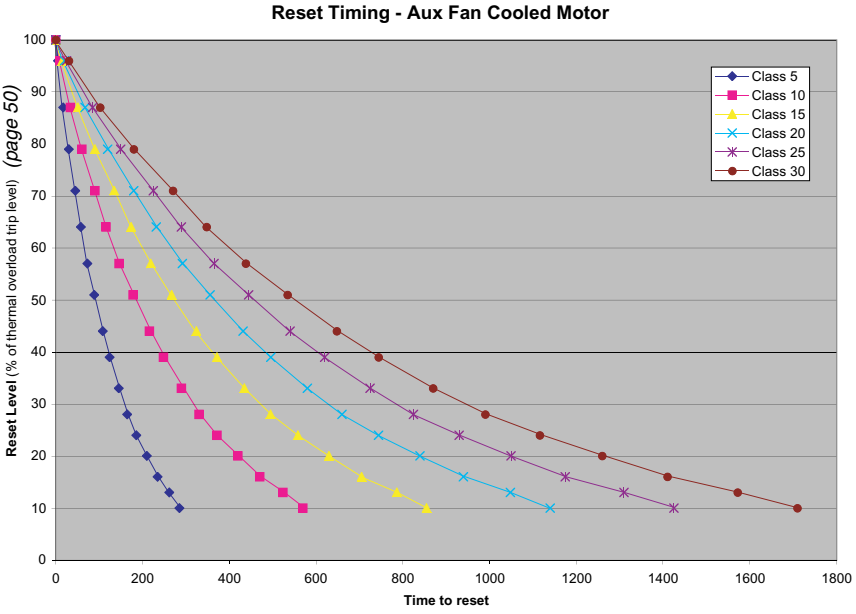
A-2 Trip Times (Cold Motor Load)



A-3 Reset Times (With Aux Fan Cooled function "disabled")



A-4 Reset Times (With Aux Fan Cooled function "enabled")



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Appendix B - Display Words

LCD Display Words *(line 1 : line 2)*	Condition
Config. : (blank)	First power up *(see **Config Menu (Configuration Menu)**, page 27).*
Config. Menu: (menu option)	*(see **Config Menu (Configuration Menu)**, page 27).*
Int Trip : (error code)	Multifunction Control Unit Internal Fault *(see **Warnings and Faults (diagnostics)**, page 26)*
Main Menu : (menu option)	*(see **Main Menu**, page 35)*
*(see **Warnings and Faults (diagnostics)**, page 26)*	
Off : (blank)	Motor Off (contactor open with no power on A1, A2 terminals)
Off-Mxxxxx : Ent to Reset	Option Module Dropout([5]) (manual/remote/auto reset mode)
Off-Mod ID : Ent to Reset	Option Module ID Fault (manual/remote/auto reset mode)
Off-Comm : Ent to Reset	RS 485 communication Loss Fault (remote/auto reset mode)
Off-Imbal : Ent to Reset	Phase Imbalance Fault (remote/auto reset mode)
Off-Jam : Ent to Reset	Jam Fault (remote/auto reset mode)
Off-LongSt : Ent to Reset	Long Start Fault (remote/auto reset mode)
Off-OL : Auto xxx (seconds)	Thermal Overload Fault (auto reset mode)
Off-OL : Ent to Reset	Thermal Overload Fault (remote reset mode)
Off-OL : Wait xxx (seconds)	Thermal Overload Fault (remote reset mode)
Pause : (blank)	Motor Paused (contactor open with power on A1, A2 terminals)
Off-Test : Auto xxx (seconds)	Test Trip - network or keypad (auto reset mode)
Off-Test : Ent to Reset	Test Trip - network or keypad (remote reset mode)
Off-Test : Wait xxx (seconds)	Test Trip - network or keypad (remote reset mode)
Off-UndrLd : Ent to Reset	Underload Current Fault (remote/auto reset mode)
Pause : (blank)	Motor Paused (contactor open with power on A1, A2 terminals)
Ready : (blank)	Power contacts closed with no current detected
Start : (run mode scroll)	Motor Starting
Tripped : CommLoss	Comm Loss Trip (manual/remote/auto reset mode)
Tripped : Ground Fault	Ground Fault Trip Indication (manual/remote/auto reset mode)
Tripped : Mxxxxx	Option Module Trip([5])
Tripped : Jam	Jam Fault (manual reset mode)
Tripped : LngStrt	Long Start Fault (manual reset mode)
Tripped : MagTrip	Magnetic Fault (manual/remote/auto reset mode)
Tripped : Over_load	Thermal Overload Fault (manual reset mode)
Tripped : PhasImb	Phase Imbalance Fault (manual reset mode)
Tripped : Short	Short Circuit Fault (manual/remote/auto reset mode)
Tripped : Shunt	Shunt Trip from network (manual/remote/auto reset mode)

LCD Display Words *(line 1 : line 2)*	Condition
Tripped : Test Trip	Test Trip - network or keypad (manual reset mode)
Tripped : UndrLoad	Underload Fault (manual reset mode)
Warn-Comm : (run mode scroll)	RS 485 communication Loss Warning
Warn-ModID : (run mode scroll)	Option Module ID Warning
*(see **Warnings and Faults (diagnostics)**, page 26)*	
WarnMxxxxx ; (run mode scroll)	Option Module Warning([6])
Warn-GF: (run mode scroll)	Ground Fault Warning
Warn-Imbal: (run mode scroll)	Phase Imbalance Warning
Warn-IntTmp: (run mode scroll)	Multifunction Control Unit Internal Temperature Warning
Warn-Jam: (run mode scroll)	Jam Warning
Warn-LongSt: (run mode scroll)	Long Start Warning
Warn-OL: (run mode scroll)	Overload Warning
Warn-UndrLd: (run mode scroll)	Underload/Current Warning

(6) Mxxxxx indicates Warning, Dropout or Fault code. See option module instruction manual for Fault code identification.

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Appendix C - Register data format

From 50 to 95, identification registers, read only						
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**	
50 to 63	(see LULC031 communication module user's manual)					
64 to 69			ASCII	0.15 to 0.6 A	**LUCMx6BL**	Catalog Number
				0.35 to 1.4 A	**LUCM1xBL**	
				1.25 to 5 A	**LUCM05BL**	
				3 to 12 A	**LUCM12BL**	
				4.5 to 18 A	**LUCM18BL**	
				8 to 32 A	**LUCM32BL**	
				0.35 to 1.05 A	**LUCMT1BL**	
70 to 73					**LUCM••BL** Serial reference	
74					Reserved	
75	0	0 - 1	Off/On	0	Unknown Control unit	
	1	0 - 1	Off/On	0	**LUCA** standard control unit	
	2	0 - 1	Off/On	0	**LUCB/CC/CD** advanced control unit	
	3	0 - 1	Off/On	0	Reserved	
	4	0 - 1	Off/On	1	**LUCM••BL**	Multifunction Control Unit
76		1000 - 29999			**LUCM••BL**	Firmware revision
77		1000 - 29999		0	**LUCM••BL**	Compatibility revision
78		0 - 65535	0.1%	4000 3000*	Sensor Scale Ratio (max / min x1000) ***For LUCMT1BL only**	
79		0 - 65535	0,1 A	6	0.15 to 0.6 A	Sensor maximum
				14	0.35 to 1.4 A	
				50	1.25 to 5 A	
				120	3 to 12 A	
				180	4.5 to 18 A	
				320	8 to 32 A	
80	0	0 - 1	Off/On	0	Power Base unknown	
	1	0 - 1	Off/On	0	Overload relay/Controller	
	2	0 - 1	Off/On	0	Starter	
	3	0 - 1	Off/On	1	Self protected combination starter	
	4-15	0 - 1	Off/On	0	Reserved	
81		0 - 65535	0.1 A	120	12 A	Power Base Range
				320	32 A	
				8400	Overload relay/Controller	

From 50 to 95, identification registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
82 - 87					Overload relay/Controller : Catalog Number
88 - 92					Overload relay/Controller : Serial reference
93					Overload relay/Controller : Firmware revision
94					Reserved
95		10 - 8000	0.1%	10	Current Transformer Ratio
				Calculated*	***For LUCMT1BL only**

From 100 to 277, statistics registers, read only						
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**	
100		0 - 65535	Quantity	0	Number Short Trips	
101		0 - 65535	Quantity	0	Number Magnetic Trips	
102		0 - 65535	Quantity	0	Number Ground Fault Trips	
103		0 - 65535	Quantity	0	Number Thermal Trips	
104		0 - 65535	Quantity	0	Number Long Start Trips	
105		0 - 65535	Quantity	0	Number Jam Trips	
106		0 - 65535	Quantity	0	Number Phase Imbal. Trips	
108		0 - 65535	Quantity	0	Number Shunt Trips	
109		0 - 65535	Quantity	0	Number Comm Loss Trips	
110		0 - 65535	Quantity	0	Number LULC031 communication module Internal Faults	
111		0 - 65535	Quantity	0	Number Module identification Faults	
112		0 - 65535	Quantity	0	Number Module internal Faults	
113		0 - 65535	Quantity	0	Number Module Trips	
114		0 - 65535	Quantity	0	Number Module Dropouts	
115		0 - 65535	Quantity	0	Number Auto Resets	
116		0 - 65535	Quantity	0	Number Thermal Warnings	
117 - 118		0-4.2 billion	Quantity	0	Number of Starts	
119 - 120		0-4.2 billion (136 years)	Seconds	0	Operating Time	
121		0 - 200	Degrees C	0	Max Control unit Internal Temp	
150		0 - 65535	None	0	Trip n-0	Fault Number
151		25 - 100	% FLA max	0		FLA Current Setting
152		0 - 100	%	0		Thermal Level
153		0 - 2,000	% FLA	0		IIAV Average Current
154		0 - 2,000	% FLA	0		IL1 Current
155		0 - 2,000	% FLA	0		IL2 Current
156		0 - 2,000	% FLA	0		IL3 Current
157		0 - 2,000	% FLA	0		IGF Current
180		0 - 65535	None	0	Trip n-1	Fault Number
181		25 - 100	% FLA max	0		FLA Current Setting
182		0 - 100	%	0		Thermal Level
183		0 - 2,000	% FLA	0		IIAV Average Current
184		0 - 2,000	% FLA	0		IL1 Current
185		0 - 2,000	% FLA	0		IL2 Current

From 100 to 277, statistics registers, read only						
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**	
186		0 - 2,000	% FLA	0	(Trip n-1)	IL3 Current
187		0 - 2,000	% FLA min	0		IGF Current
210		0 - 65535	None	0	Trip n-2	Fault Number
211		25 - 100	% FLA max	0		FLA Current Setting
212		0 - 100	%	0		Thermal Level
213		0 - 2,000	% FLA	0		IIAV Average Current
214		0 - 2,000	% FLA	0		IL1 Current
215		0 - 2,000	% FLA	0		IL2 Current
216		0 - 2,000	% FLA	0		IL3 Current
217		0 - 2,000	% FLA	0		IGF Current
240		0 - 65535	None	0	Trip n-3	Fault Number
241		25 - 100	% FLA max	0		FLA Current Setting
242		0 - 100	%	0		Thermal Level
243		0 - 2,000	% FLA	0		IIAV Average Current
244		0 - 2,000	% FLA	0		IL1 Current
245		0 - 2,000	% FLA	0		IL2 Current
246		0 - 2,000	% FLA	0		IL3 Current
247		0 - 2,000	% FLA	0		IGF Current
270		0 - 65535	None	0	Trip n-4	Fault Number
271		25 - 100	% FLA max	0		FLA Current Setting
272		0 - 100	%	0		Thermal Level
273		0 - 2,000	% FLA	0		IIAV Average Current
274		0 - 2,000	% FLA	0		IL1 Current
275		0 - 2,000	% FLA	0		IL2 Current
276		0 - 2,000	% FLA	0		IL3 Current
277		0 - 2,000	% FLA	0		IGF Current

From 450 to 454, monitoring (fault) registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
450		0 - 1000	Seconds	0	Time to Auto Reset
451	(see LULC031 communication module user's manual)				
452	0	0 - 1	Off/On	0	Short Circuit Fault
	1	0 - 1	Off/On	0	Magnetic Fault

From 450 to 454, monitoring (fault) registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
(452)	2	0 - 1	Off/On	0	Ground Fault
	3	0 - 1	Off/On	0	Thermal Overload Fault
	4	0 - 1	Off/On	0	Long Start Fault
	5	0 - 1	Off/On	0	Jam Fault
	6	0 - 1	Off/On	0	Phase Imbalance Fault
	7	0 - 1	Off/On	0	Underload Fault
	8	0 - 1	Off/On	0	Shunt Trip (network)
	9	0 - 1	Off/On	0	Test Trip Fault
	10	0 - 1	Off/On	0	Comm Loss Fault
	11	0 - 1	Off/On	0	Control unit Internal Fault
	12	0 - 1	Off/On	0	Module Identification Fault
	13	0 - 1	Off/On	0	Module Internal Fault and loss of communication
	14	0 - 1	Off/On	0	Module Trip Fault
	15	0 - 1	Off/On	0	Module dropout fault OA1 and OA3 1 = Forced to 1 0 = Forced to 0
453	1	0 - 1	Off/On	0	No action fault
454					Reserved

From 455 to 459, monitoring (status) registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
455	0	0 - 1	Off/On	0	Ready
	1	0 - 1	Off/On	0	On (= 1 contactor switched on)
	2	0 - 1	Off/On	0	Fault (overload , magnetic, short-circuit, internal fault)
	3	0 - 1	Off/On	0	Warning
	4	0 - 1	Off/On	0	Tripped
	5	0 - 1	Off/On	0	Reset authorized
	6	0 - 1	Off/On	0	A1 - A2 on
	7	0 - 1	Off/On	0	Motor Running
	8-13	0 - 1	Off/On	0	Average Current %
	14	0 - 1	Off/On	0	Reserved
	15	0 - 1	Off/On	0	Motor Starting

From 455 to 459, monitoring (status) registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
456	0	0 - 1	Off/On	0	Auto Resetting
	1	0 - 1	Off/On	0	Motor Paused
	2-15	0 - 1	Off/On	0	Reserved
457	(see LULC031 communication module user's manual)				
458					Reserved
459					Reserved

From 460 to 464, monitoring (warning) registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
460		0 - 65535	None		Warning Number
461	0-1	0 - 1	Off/On		Reserved
	2	0 - 1	Off/On		Ground Fault Warning
	3	0 - 1	Off/On		Thermal Warning
	4	0 - 1	Off/On		Long Start Warning
	5	0 - 1	Off/On		Jam Warning
	6	0 - 1	Off/On		Phase Imbalance Warning
	7	0 - 1	Off/On		Under Current Warning
	8-9	0 - 1	Off/On		Reserved
	10	0 - 1	Off/On		Comm Loss (485 port)
	11	0 - 1	Off/On		Control unit Internal Temperature
	12	0 - 1	Off/On		Module Identification Warning
	13-14	0 - 1	Off/On		Reserved
	15	0 - 1	Off/On		Module Warning
462				0	Reserved
463				0	Reserved
464				0	Reserved

From 465 to 599, monitoring (measurements) registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
465		0 - 100	% TripLevel		Thermal Capacity Level
466		0 - 2,000	% FLA		IIAV Average Current
467		0 - 2,000	% FLA		IL1 Current
468		0 - 2,000	% FLA		IL2 Current

From 465 to 599, monitoring (measurements) registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
469		0 - 2,000	% FLA		IL3 Current
470		0 - 2,000	% FLA min		IGF Current
471		0 - 100	% IMB		Phase Imbalance
472		-40 to +200	Degrees C		Control unit Internal Temperature
473		0 - 65535	None	0	Configuration Checksum (Checksumrotate registers 600-699)
474 - 599					Reserved

From 600 to 630, configuration registers, read and write accessible if the starter is stopped						
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**	
600		0000 - 9999	4 digits	0000	Password	
601	0	0 - 1	Off/On	1	Configuration Required ***Can not set to if CT_Ratio is invalid***	
	1*	0 - 1	Off/On	0	Reserved	
	2*	0 - 1	Off/On	1	TeSys® model U Power Base Type 0 = Starter (or Overload relay/Controller) 1 = Self protected starter	
	3*	0 - 1	Off/On	0	Power Base size 12 Amp (on A1A2)	
	4*	0 - 1	Off/On	0	Power Base size 32 Amp (on A1A2)	
	5*	0 - 1	Off/On	0	Reserved	
	6-12*	0 - 1	Off/On	0	Reserved	
	13*	0 - 1	Off/On	1	3 Phase Motor	
	14*	0 - 1	Off/On	0	1 Phase Motor	
	15*	0 - 1	Off/On	0	Aux Fan Cooled	
	***Can not be set on LUCMT1BL**					
602	0	0 - 1	Off/On	1	Reset Mode - Manual	**Must set one bit in this set**
	1	0 - 1	Off/On	0	Reset Mode - Remote/ Ent	
	2	0 - 1	Off/On	0	Reset Mode - Auto	
	3	0 - 1	Off/On	0	RS 485 Comms parity	
	4	0 - 1	Off/On	1	Enable Comms control	**Must set one bit in this set**
	5	0 - 1	Off/On	1	RS 485 Watchdog Ignore	
	6	0 - 1	Off/On	0	RS 485 Watchdog Warning	
	7	0 - 1	Off/On	0	RS 485 Watchdog Dropout	
	8	0 - 1	Off/On	0	RS 485 Watchdog Trip	
	9	0 - 1	Off/On	0	RS 485 Watchdog Start (future)	

From 600 to 630, configuration registers, read and write accessible if the starter is stopped						
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**	
(602)	10	0 - 1	Off/On	0	Pause on Power Up (future)	
	11	0 - 1	Off/On	1	Enable Pause mode	
	12-15				Reserved	
603		1 - 247	Address	1	Modbus slave address	
604		1200, 4800, 9600, 19200	Baud	19200	Modbus Baud Rate	
605		300 to 1700	% FLA	1420	Magnetic Trip (**For LUCM••BL only**)	
606		5, 10, 15, 20, 25, 30	Motor Class	5	Load Class	
607		1 - 1000	Seconds	120	Thermal Reset Time	
608		35 - 100	% Capacity	75	Thermal Reset Level	
609		10 - 100	% Capacity	85	Thermal Warn Level	
610		1 - 12	0.1 Sec.	10	Ground Fault Trip Time	
611		20 - 500	% FLA min	30	Ground Fault Trip Level	
612		20 - 500	% FLA min	30	Ground Fault Warn Level	
613		2 - 200	0.1 Sec.	7	Phase Imbal. Trip Time Start	
614		2 - 200	0.1 Sec.	50	Phase Imbal. Trip Time Run	
615		10 - 30	% IMB	10	Phase Imbal. Trip Level	
616		10 - 30	% IMB	10	Phase Imbal. Warn Level	
617		1 - 30	Seconds	5	Jam Trip Time	
618		100 - 800	% FLA	200	Jam Trip Level	
619		100 - 800	% FLA	200	Jam Warn Level	
620		1 - 200	Seconds	10	Underload Trip Time	
621		30 - 100	% FLA	50	Underload Trip Level	
622		30 - 100	% FLA	50	Underload Warn Level	
623		1 - 200	Seconds	10	Long Start Trip Time	
624		100 - 800	% FLA	100	Long Start Trip Level	
625		100 - 800	% FLA	100	Long Start Warn Level	
626					Reserved	
627					Reserved	
628		1 -65535	None	0	Primary	**For LUCMT1BL only**
629		1 -65000	None	1	Secondary	
630		1 -65000	None	1	Exter_Pass	

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From 650 to 690, setting registers, read/write accessible						
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**	
650	0	0 - 1	Off/On	1	English	**Must set one bit in this set**
	1	0 - 1	Off/On	0	Francais	
	2	0 - 1	Off/On	0	Español	
	3	0 - 1	Off/On	0	Deutsch	
	4	0 - 1	Off/On	0	Italiano	
651	0	0 - 1	Off/On	1	IIAV Average Current	
	1	0 - 1	Off/On	1	Thermal Level	
(651)	2	0 - 1	Off/On	0	IL1 Current	
	3	0 - 1	Off/On	0	IL2 Current	
	4	0 - 1	Off/On	0	IL3 Current	
	5	0 - 1	Off/On	0	IGF Current	
	6	0 - 1	Off/On	0	Last Trip	
	7	0 - 1	Off/On	1	Phase Imbalance	
652		25 - 100	% FLA max	25	FLA Current Setting	
681 - 683	(see LULC031 communication module user's manual)					
690	(see LULC031 communication module user's manual)					

From 700 to 705, command registers, read/write accessible					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
700 - 703	(see LULC031 communication module user's manual)				
704	0	0 - 1	Off/On	0	Run Forward (with LUC031 Module)
	1	0 - 1	Off/On	0	Run Reverse (with LUC031 Module)
	2	0 - 1	Off/On	0	Reserved
	3	0 - 1	Off/On	0	Reset
	4	0 - 1	Off/On	0	Reserved
	5	0 - 1	Off/On	0	Initiate Test trip
	6-11	0 - 1	Off/On	0	Reserved
	12	0 - 1	Off/On	0	Shunt Trip (network)
	13	0 - 1	Off/On	0	Pause Motor
	14-15				Reserved

From 700 to 705, command registers, read/write accessible					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
705	0	(see LULC031 communication module user's manual)			
	1	0 - 1	Off/On	0	Reset Statistic Counts
	2	0 - 1	Off/On	0	Reset Thermal Memory
	3-15	0 - 1	Off/On	0	Reserved

From 1000 to 1012, HMI monitoring registers, read only					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
1000	0	0 - 1	Off/On	0	Escape Key
	1	0 - 1	Off/On	0	Up Key
	2	0 - 1	Off/On	0	Down Key
(1000)	3	0 - 1	Off/On	0	Enter Key
1001-1006					Menu Ascii Line 1
1007-1012					Menu Ascii Line 2

1100, HMI command registers, read/write accessible					
16-bit register	**Bit**	**Range**	**Unit**	**Default value**	**Information**
1100	0	0 - 1	Off/On	0	Escape Key
	1	0 - 1	Off/On	0	Up Key
	2	0 - 1	Off/On	0	Down Key
	3	0 - 1	Off/On	0	Enter Key

Appendix D - Fault and Warning Codes

D-1 Fault code summary

A "fault code number" appears in register 451 and in the trip statistics Registers 150, 180, 210, 240 and 270 upon an error condition per the table below.

NOTE: *Internal Multifunction Control Unit Faults are not saved in the trip statistics registers 150, etc.*

Code	Fault condition
0	None
1	Short Circuit Trip
2	Magnetic Trip
3	Ground Fault Trip
4	Thermal Overload Fault
5	Long Start Fault
6	Jam Fault
7	Phase Imbalance Fault
8	Underload Fault
9	Shunt Trip
10	Test Trip (simulates thermal overload)
11	RS 485 Comm Loss Fault (dropout)
12	RS 485 Comm Loss Fault (tripped)
13	Reserved
14	Module Identification Fault, *see* ***61_ID Clear*** *(page 69) and see* ***63_Id Set*** *(page 70)*
15	Module missing or not power up
51	Multifunction Control Unit Internal Temperature Fault or broken sensor
52	PROA read-after-write FPROAault
53	PROA initialize Fault
54	MPDB Fault
55	Stack Overflow Fault
56	RAM Fault
57	ROM (flash) Checksum Fault
58	Hardware Watchdog Fault
59	Current detected while Off/Pause
60	I2 detected in Single Phase Mode
61	Trip Indicator not detected (only with "smart" module)
62	A2 missing (wiring error)
63	A1 Overvoltage
xx	Module Internal Fault (provided by module)
xx	Module Trip Fault (provided by module)
xx	Module Drop Out Fault (provided by module)

D-2 Warning code summary

A "warning code number" appears in register upon a warning condition per the table below.

NOTE: *Internal Multifunction Control Unit Faults are not saved in the trip statistics registers 150, etc.*

Code	Fault condition
0	None
1	Reserved
2	Reserved
3	Ground Fault Warning
4	Thermal Overload Warning
5	Long Start Warning
6	Jam Warning
7	Phase Imbalance Warning
8	Underload Fault Underload Warning
9	Reserved
10	RS 485 Communication Loss Warning
11	Multifunction Control Unit Internal Temperature Warning
12	Module Identification Warning
13	Reserved
xx	Multifunction Control Unit Warning (provided by module)

Appendix E - Powersuite™

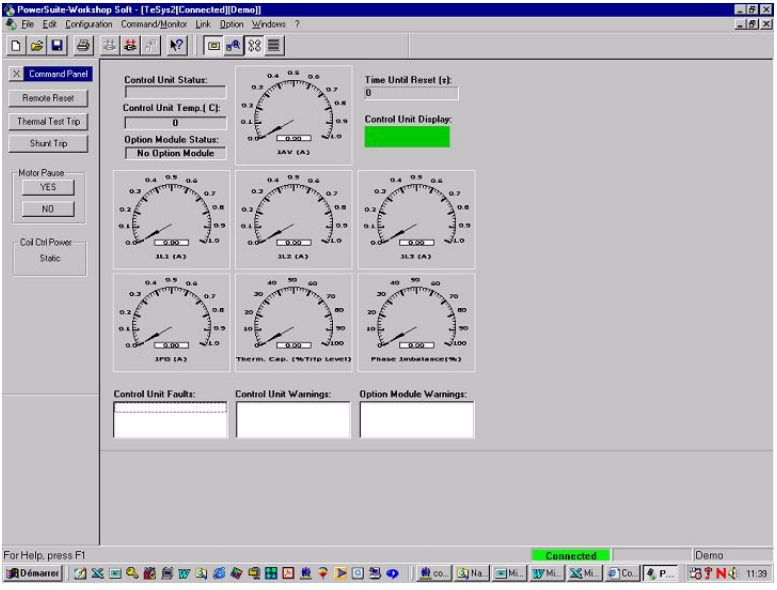
The software environment Powersuite (version ≥ V1.40) can be used to configure and commission the control unit from a PC in a Microsoft Windows 95, 98,NT4, 2000 and XP environment.

It can be used:

- Alone to prepare and store configuration files for the LUCM control unit on a diskette, CD-ROM or hard disk.
  The control unit configuration can be edited on paper or exported to office software.
- Connected to the ModBus port of the control unit to configure and adjust the different motor protection functions or download a configuration file from the PC to the control unit or vice versa. A control panel displays the states and current values of the starter-controller. This fully functional instrument panel makes it possible to follow the main characteristics of the starter in real time and with a high level of user-friendliness:
  - heat capacity
  - mean value and value per phase of the motor current
  - ground-fault current
  - % of phase unbalance
  - The starter states and alarms related to the protection functions are also displayed.

The test controls for protection against thermal overload and over-current are available on the control panel.

The configuration registers, monitoring registers, status and control registers of the control unit can be accessed and their contents are displayed. The contents of the configuration registers can be modified.



See specific documentation.