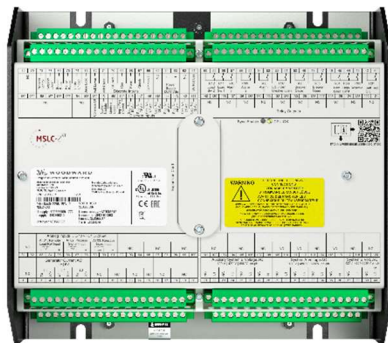




MSLC-2XT™ Master Synchronizer and Load Control

New Features

- ✓ Direct Connect Up to 690 V_{AC}
- ✓ Software selectable 1A/5A CT input
- ✓ Enhanced hardware isolation
- ✓ Three Ethernet communication ports
- ✓ Drop-In replacement*

DESCRIPTION

Woodward's MSLC-2XT™ functions with the DSLC-2XT™ control to provide synchronization and load control across Utility and Intertie breakers. The MSLC-2XT/DSL-2XT combination operates over an Ethernet communication network to control simple or complex generator system applications. This combination, 32 DSLC-2XT's and 16 MSLC-2XT's, provide multiple units, multiple segments, utility, and intertie power management for complex power systems. Controls plant wide Import / Export levels while always providing bump-less load transfers with utility.

The MSLC-2XT control combines synchronization, dead bus closing, utility/intertie load sensor, baseload control, import/export control, VAR, power factor, and a master process control in one powerful package.

The MSLC-2XT provides phase matching or slip frequency synchronization, with voltage matching, across a utility or intertie breaker. The MSLC-2XT/DSL-2XT combination can handle multiple utility connections with a maximum of 8 bus segments in one application.

The MSLC-2XT's load sensor and load control sense true RMS power and provide a bump-less loading and unloading against a utility grid. Baseload, import/export, process, and utility unload modes control the KW power between different power sources at the same time controlling the reactive power, VAR and power factor. Reactive power is also ramped on and off for the smoothest load transactions between power grids.

The MSLC-2XT communicates via Ethernet, with or without hot swap redundant communication, to control real and reactive loading against the utility by DSLC-2XT equipped generators.

The tie breaker mode allows synchronization between multiple generator systems. Segments are connected and power can be measured across an intertie, but no load control is functional when in Tie breaker operation.

FEATURES

- One MSLC-2XT can provide master control for up to 32 DSLC-2XT and an additional 15 MSLC-2XT.
- Two dedicated Ethernet lines for precise system communications between all DSLC-2XT's and MSLC-2XT's on the system.
- One dedicated Ethernet Modbus TCP for remote control and monitoring by PLC or DCS system.
- Redundant Ethernet communications for enhanced reliability.
- Master MSLC-2XT redundancy, loss of communications with the designated MSLC-2XT master initiates control hand off to the next designated MSLC-2XT master.
- The MSLC-2XT hardware is adjustable for multiple applications.
- Slip frequency or voltage phase matching synchronizing fully selectable with dead bus option in both directions provide full flexibility for intertie and main-tie-main applications.
- Having functions integrated into one box eliminates the need for redundant sensors (like PTs, CTs, and MOPs) that connect to individual modules such as the load sensor and synchronizer.
- Digital signal processing makes the MSLC-2XT resistant to power line distortions and harmonics.
- Three-phase true RMS power sensing provides accurate readings even with unbalanced phase loading and voltage fluctuations.
- Export/import control over multiple utility MSLC-2XT's in same segment.
- The Woodward ToolKit™ software allows flexible setup using the same basic menu tree as the original MSLC-2 plus an overview screen. Graphical overview of generators and bus bar parameters with trending makes the MSLC-2XT commissioning friendly.
- The Toolkit can be accessed either via one of the Ethernet ports or via USB port.
- Phase angle compensation provides adjustment for additional deviation correction across a transformer.
- The system update feature allows for system reconfiguration.

*Woodward offers update files should legacy MSLC-2 be mixed with the new MSLC-2XT

- Applications for up to 32 generators with 16 mains and/or tie breakers
- Configurable for mains and tie breaker applications
- Complex applications with up to 8 bus segments
- Automatic segment recognition
- Redundant Ethernet communication for enhanced reliability
- The "system update" feature allows for system reconfiguration
- PLC and DCS compatible via Modbus RTU or Modbus TCP
- Automatic plant loading and unloading for bump-less load transfer to and from the utility
- Controls plant wide import/export levels against the utility
- Overall plant Power Factor control
- Ethernet or USB port for configuration of device using Woodward ToolKit software
- UL/cUL & CE Listed; ABS type approved

SPECIFICATIONS

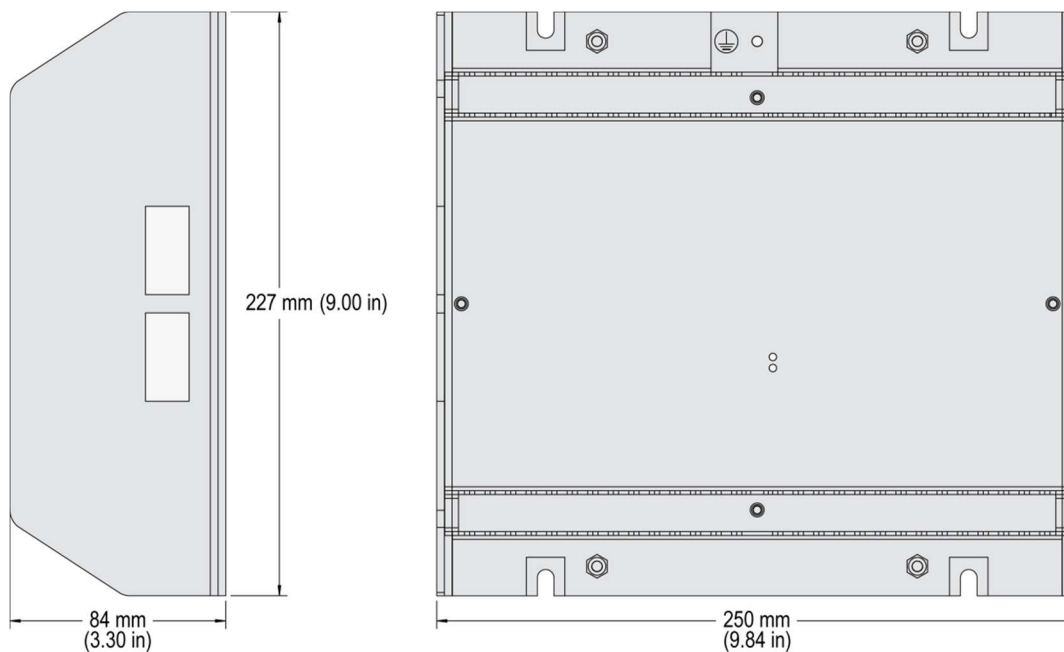
Power supply	12/24 Vdc (8 to 40 Vdc)
Intrinsic consumption	max. 32 W
Ambient temperature (operation)	-40°C to 70°C / -40 to 158°F
Ambient temperature (storage)	-40°C to 80°C / -40 to 176°F
Ambient humidity	95%, non-condensing
Voltage (software configurable)	(Δ/Δ)
Rated ($V_{LLrated}$)	100 Vac up to 690 Vac
Max. value (V_{LLmax})	897 Vac
Rated surge volt. (V_{surge})	6.0 kV
Accuracy	Class 0.5
Measurable alternator windings	3p-3w*, 3p-4w, 3p-4w OD
Setting range	primary.....50 to 650,000 Vac
Linear measuring range	1.3× V_{rated}
Measuring frequency	50/60 Hz (30 to 85 Hz)
High Impedance Input; Resistance per path	2.5 M Ω
Max. power consumption per path	< 0.15 W
Current (galvanically isolated) Rated (I_{rated})	1 A or 1/5 A
Linear measuring range	$I_{gen} = 3.0 \times I_{rated}$
	$I_{mains/ground} = 1.5 \times I_{rated}$
Setting range	1 to 32,000 A
Burden	< 0.10 VA
Rated short-time current (1 s)	50 A
Accuracy	Class 0.5

Power	
Setting range	0.5 to 999,999.9 MW/kvar

Discrete inputs	galvanically isolated
Input range	12/24 Vdc (8 to 40 Vdc)
Input resistance	approx. 20 kOhms
Relay outputs	galvanically isolated / potential free
Contact material	AgNi
Load (GP)	2.00 Aac@250 Vac
	2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc** / 0.18 Adc@250 Vdc**
Pilot duty (PD)	
	1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc

Analog inputs (not isolated)	freely scalable
Type	0 to 10 V / 0/4 to 20 mA
Resolution	14 bits
Housing	Sheet metal for back panel mounting
Dimensions	WxHxD250 × 227 × 84 mm (9.84 × 9.00 × 3.30 in)
Connection	screw/plug terminals 2.5 mm ²
Protection system	IP 20
Weight	approx. 2,480 g (5.46 lbs.)
Disturbance test (CE)	tested according to applicable EN guidelines
Listings	UL, cUL, CE, CSA, EAC
Marine	ABS (Type Approval), LR (Type Approval)

DIMENSIONS



* 3 phase 3 wire Δ constellations are limited to 600 VAC system

** Relay rating not suitable for USA and Canada applications. Not evaluated by UL

TERMINAL DIAGRAM

80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
NC		Process Control	Setpoint Lower	Setpoint Raise	Ramp Pause	Utility Unload	Base Load	Volt Lower	Volt Raise	CB Aux	Run	Perm	Check	Common DI	NC	-	+	NC	Do Not Use	R12 Load Sw 2	R11 Load Sw 1	R10 Alarm 3	R09 Alarm 2	R08 Alarm 1	R07 Lcl. / Gen. Breaker open	R06 Breaker Close	R05 Breaker Open	R04 Low Limit	R03 High Limit	R02 Reserve	R01 Self Test OK								
160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128	127	126	125	124	123	122	121
NC						NC		Common DI	System Update	Modbus Reset	Imp / Exp Control	Seg. No. 8 Act	Seg. No. 7 Act	Seg. No. 6 Act	Seg. No. 5 Act	Seg. No. 4 Act	Seg. No. 3 Act	Seg. No. 2 Act	Seg. No. 1 Act	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
Discrete Inputs															Relay Outputs																								



Expansion Card

Sync Enable ☐ CPU OK ☐

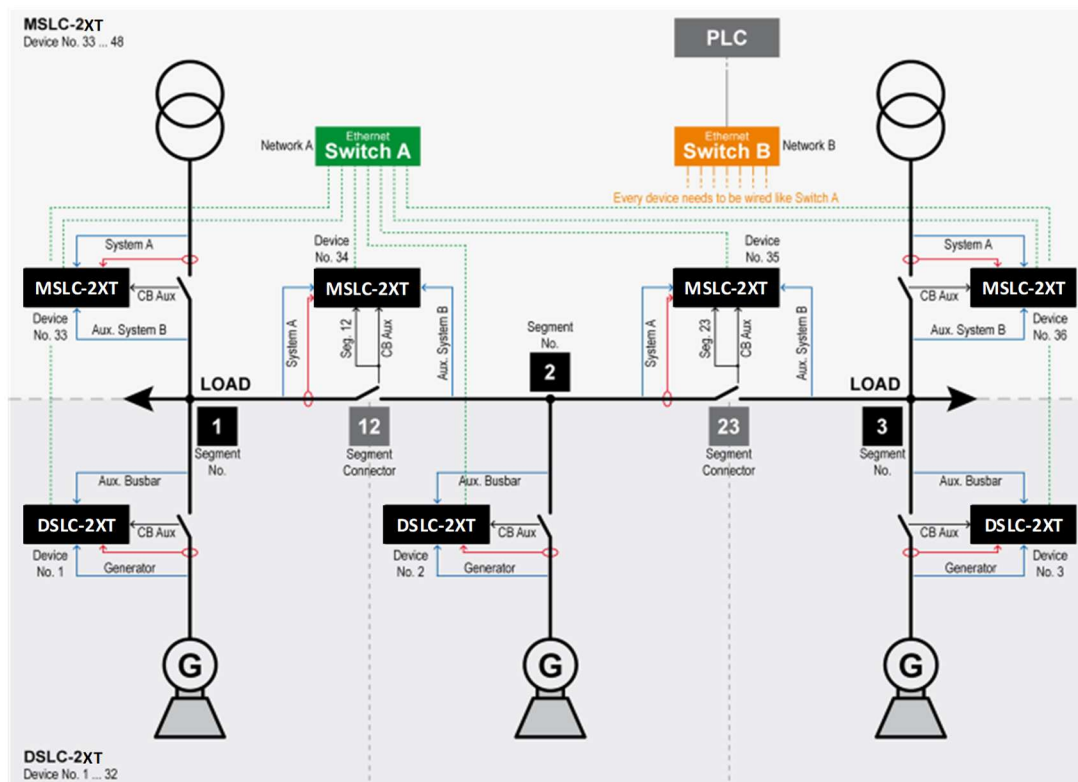
http://www.manuals.com/dslc_mslc

Analog Inputs 0 to 10 V 0/4 to 20 mA																			
NC		AI 01: Remote Load Ref Input - mA		AI 02: Process Signal Input - mA		AI 03: Reactive Load Input - mA		+		NC		NC		NC					
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Generator Current AC 1A 5A																			
NC		L1		L2		L3				NC		NC		NC		NC		NC	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120														
Auxiliary System B Voltage AC 120 V 480 V 690 V ph-ph								System A Voltage AC 120 V 480 V 690 V ph-ph								System B Volt. AC 120 V 480 V 690 V ph-ph																	
NC		L1		L2		L3		NC		N		NC		L1		L2		L3		NC		N		NC		L1		L2		L3		N	
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40														

MSLC-2XT – terminal diagram

TYPICAL CONFIGURATION



Configuration of a typical application using DSLC-2XT and MSLC-2XT devices in combination

CONTACT

North & Central America

Tel.: +1 (208) 278 3370

South America

Tel.: +55 19 3708 4800

Europe

Tel.: +49 711 78954 510

Middle East & Africa

Tel.: +971 2 678 4424

Russia

Tel.: +49 711 78954 515

China

Tel.: +86 512 8818 5515

India

Tel.: +91 124 4399 500

ASEAN & Oceania

Tel.: +49 711 78954 510

SALES SUPPORT

✉ industrial.sales_PG@woodward.com

TECHNICAL SUPPORT

✉ industrial.support@woodward.comwww.woodward.com

Subject to alterations, errors excepted.

Subject to technical modifications.

This document is distributed for informational purposes only. It is not to be construed as creating or becoming part of any Woodward Company contractual or warranty obligation unless expressly stated in a written sales contract.

We appreciate your comments about the content of our publications. Please send comments including the document number below to marketing_pg@woodward.com

© Woodward

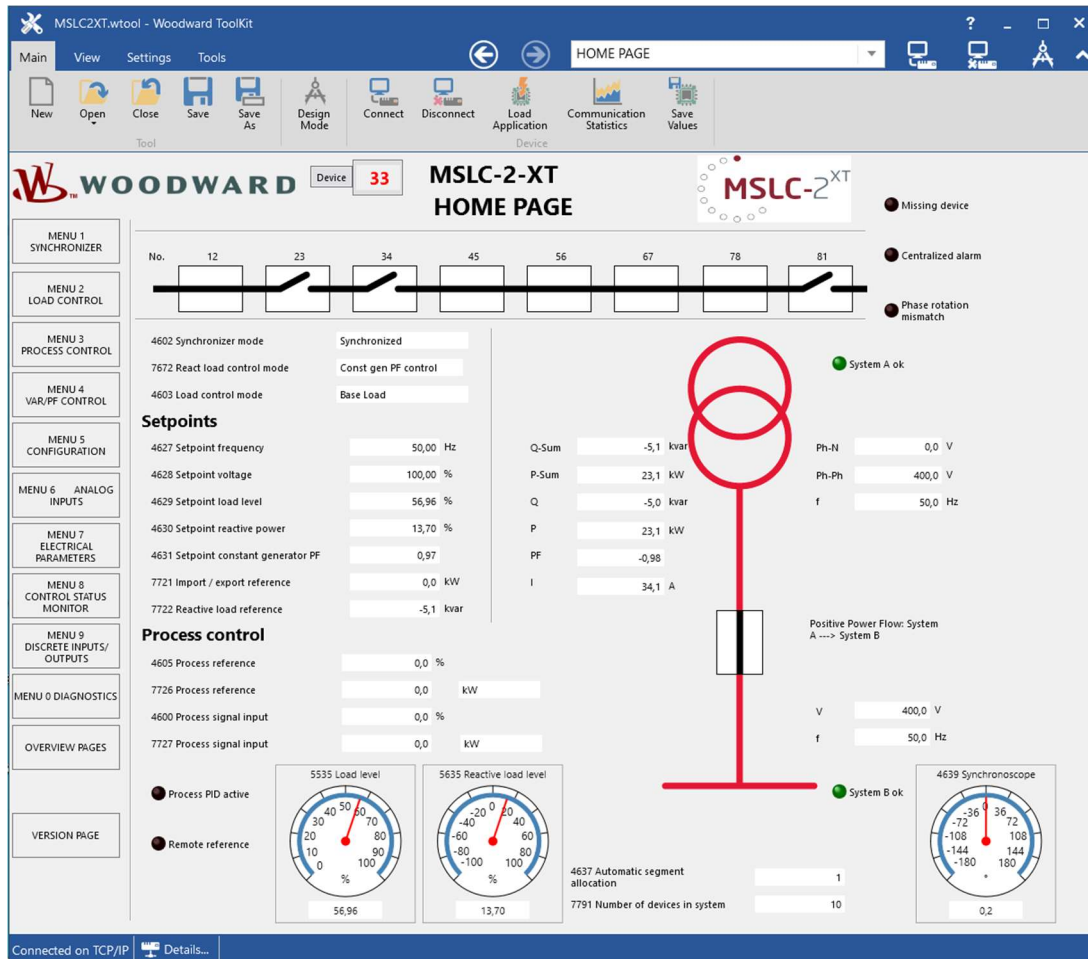
All Rights Reserved

For more information contact:

TOOLKIT CONFIGURATION SOFTWARE

Woodward's ToolKit provides user friendly configuration, commissioning assistance, displays all operating modes, and the overview pages show what other controls the MSLC-2XT is communicating with. The MSLC-2XT Home Page is shown below.

Note: The menu tree illustrated on the left side is similar to the original MSLC-2 structure.



FEATURES OVERVIEW

	DSL-2XT	MSLC-2XT
I/Os		
Discrete inputs	23	23
Relay outputs	12	12
Analog inputs	3	3
Analog outputs	2	-
USB Interface	1	1
RS-485 Interface	1	1
Ethernet Interfaces (10/100 Mbit/s)	3	3
LED 1 "CPU OK"	Off / not ready / ready / system update active	Off / not ready / ready / system update active
LED 2 "Sync Enable"	Off / ready / not OK	Off / ready / not OK
Listings/Approvals		
UL / cUL Listing	✓	✓
CSA & EAC	✓	✓
LR & ABS Marine	✓	✓
CE Marked	✓	✓
Part Numbers		
Control with mounting KITs	8440-2299	8440-2298
Spare connector KIT	8923-2320	

➔ Product documentation site, http://wwdmanuals.com/dslc_mslc