OWNER'S MANUAL

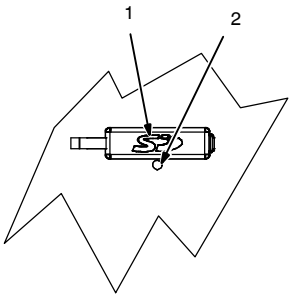
FORM: OM-265415J 2020-06

For Modbus Expansion On Dynasty®/Maxstar® Models

1. Safety Symbol Definitions

	DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text. **DANGER** ! - Indique une situation dangereuse qui, si elle n'est pas évitée, entraînera la mort ou des blessures graves. Les éventuels risques sont représentés par les symboles joints ou expliqués dans le texte. Fsafe1 2013-10		Have only trained and qualified persons install, operate, or service this unit. Read the safety information at the beginning of these instructions and in each section. Call your distributor if you do not understand the directions. For WELDING SAFETY and EMF information, read owner's manual(s). Ne confiez l'installation, l'exploitation ou l'entretien de cet appareil qu'à des personnes compétentes et qualifiées. Lire les directives de sécurité au début de ces instructions et dans chaque section. Appeler votre distributeur si vous ne comprenez pas les directives. Lire le(s) manuel(s) d'utilisateur pour des renseignements sur la SÉCURITÉ DE SOUDAGE et les champs électromagnétiques. Fsafe15 2013-10
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury**.** The possible hazards are shown in the adjoining symbols or explained in the text. Indique une situation dangereuse qui, si elle n'est pas évitée, entraînera la mort ou des blessures graves. Les éventuels risques sont représentés par les symboles joints ou expliqués dans le texte. Fsafe2 2013-10		Wear safety glasses with side shields. Porter des lunettes de sécurité avec écrans latéraux. Fsafe8 2013-10
NOTICE ☞	*Indicates statements not related to personal injury.* *Signale des consignes non associées aux dommages corporels.* *Indicates special instructions.* *Fournit des instructions spéciales.* Fsafe3 2013-10		**CALIFORNIA PROPOSITION 65 WARNINGS** **WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov** **PROPOSITION CALIFORIENNE 65 AVERTISSEMENTS** **AVERTISSEMENT : cancer et troubles de la reproduction – www.P65Warnings.ca.gov.** Fsafe26 2018-01

2. Software Expansion



☞ *A software update is required to ensure proper operation of all purchased feature expansions. For instructions to download TIG Software updates, see PDF file F26927 on software expansion memory card.*

Card Requirements:

☞ *Purchased software expansion memory card required.*

1 Memory Card Port

2 Indicator LED

Enabling Software Expansion:

Insert card containing software expansion into port.

LED indicator blinks green while machine is reading from or writing to the card. After successfully reading from or writing to the card, the LED switches from blinking green to continuous green. The machine is now ready to use software expansion. **Do not** remove card while LED is blinking green.

☞ *Software expansion card must remain in memory card port to enable software expansion.*

Disabling Software Expansion:

Remove the software expansion card from the memory card port.

Troubleshooting:

Problem: Indicator LED is continuous red.

Remedy: Remove and reinsert card. If problem continues, the card is bad. Contact Factory Authorized Service Center for a replacement card.

The memory card port uses an SD memory card. The SD Logo is a trademark of the SD-3C LLC Company.

Modbus Expansion – Enabling the Modbus expansion configures Remote 14 sockets L, M and N for Modbus control in Dynasty and Maxstar Models. Modbus serial communication provides access to all front panel parameters and machine functionality. Modbus expansion also includes functionality of Automation(OM-265411), AC Independent Expansion(Dynasty only, OM-267827), Hot Wire (OM-273055), and Hot Start Adjust (OM-276515).

☞ *When Modbus Expansion is used in a Dynasty 210 or 280 DX CE machine, the user Menu ENEP selection is not accessible. AC Independent is always enabled.*

☞ *Owner's Manuals OM-265415 , OM-265411, OM-267827, OM-273055, and OM-276515 can be found on the memory card. Software updates may make all OMs listed, and this OM obsolete. The latest revisions of all OMs can be downloaded from www.Millerwelds.com*

Additional Parts Required: Plug and pins required to connect to the Dynasty or Maxstar Remote 14 receptacle can be obtained from Miller Electric Mfg. Co. Parts Dept.: Order Part No. 141162 – Housing Plugs + Pins (service kit), and install according to instructions provided with the kit.

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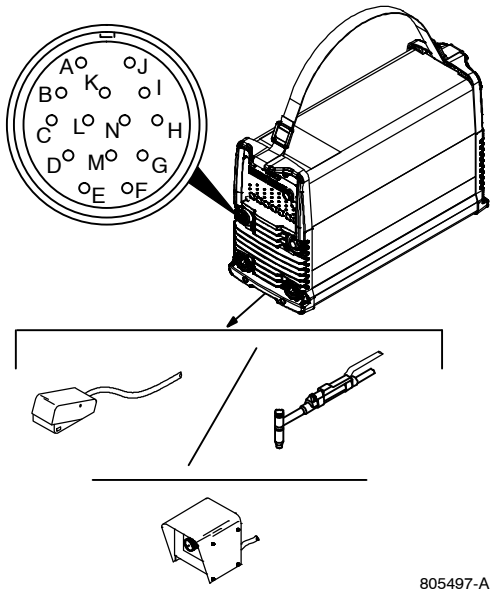
3. Software Licensing Agreement

The End User License Agreement and any third-party notices and terms and conditions pertaining to third-party software can be found at https://www.millerwelds.com/eula and are incorporated by reference herein.

4. Information About Default Weld Parameters And Settings

NOTICE *– Each welding application is unique. Although certain Miller Electric products are designed to determine and default to certain typical welding parameters and settings based upon specific and relatively limited application variables input by the end user, such default settings are for reference purposes only; and final weld results can be affected by other variables and application-specific circumstances. The appropriateness of all parameters and settings should be evaluated and modified by the end user as necessary based upon application-specific requirements. The end user is solely responsible for selection and coordination of appropriate equipment, adoption or adjustment of default weld parameters and settings, and ultimate quality and durability of all resultant welds. Miller Electric expressly disclaims any and all implied warranties including any implied warranty of fitness for a particular purpose.*

5. Remote 14 Receptacle Information



805497-A

REMOTE 14	Socket	Socket Information
15 VOLTS DC OUTPUT CONTACTOR	A	Contactor control +15 volts DC, referenced to G.
	B	Contact closure to A completes 15 volts DC contactor control circuit and enables output.
REMOTE OUTPUT CONTROL	C	Output to remote control; +10 volts DC output to remote control.
	D	Remote control circuit common.
	E	0 to +10 volts DC input command signal from remote control. *Reconfigurable as input for Output Enable (Weld Stop) – used to remotely stop the weld outside the normal welding cycle. Connection to the D socket must be maintained at all times. If the connection is broken, output stops, and Auto Stop is displayed.
Output Signals	F	Current feedback; +1 volt DC per 100 amperes.
	H	Voltage feedback; +1 volt DC per 10 volts output.
	I*	Valid arc indication closed to socket G with valid arc. Electrical specifications: open collector transistor
	J*	Arc length control lockout closed to socket G during Initial and Final Amperage and Slope, and during the background time of a <=10 Hz pulse waveform. Electrical specifications: open collector transistor
	**	Touch Sense Detection closed to Socket G, with Modbus's Touch Sense enabled and machine not triggered for weld output.
COMMON	G	Return for all output signals: F, H, I, J and A.
CHASSIS	K	Chassis
Serial Communication Bus	L**	Modbus Common (RS485 Common)
	M**	Modbus D1 (RS485 B+)
	N**	Modbus D0 (RS485 A-)

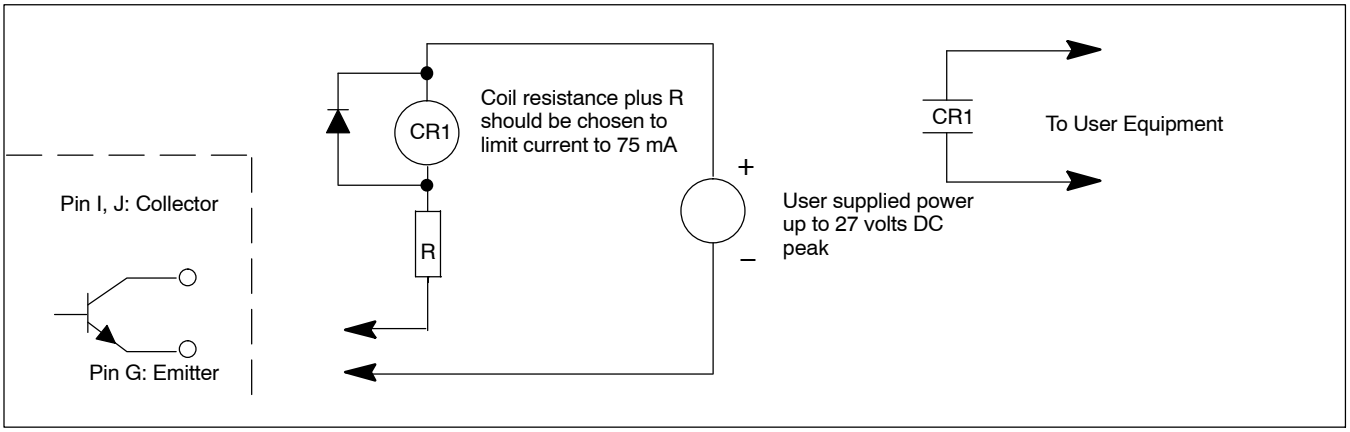
Sockets G and K are electrically isloated from each other.

☞ *If a remote hand control, like the RHC-14, is connected to the Remote 14 receptacle, some current value above min. must be set on the remote control before the Panel or Remote contactor is turned on. Failure to do so will cause current to be controlled by the panel control, and the remote hand control will not function.*

**Available with optional Automation Expansion memory card.*

***Available with optional Modbus Expansion memory card. Modbus serial communication provides access to all front panel parameters and machine functionality. See Owner's Manual 265415 for a list of Modbus registers. Modbus expansion also includes functionality of Automation, AC Independent Amplitude (Dynasty 210/280 only), Hot Wire and Hot Start Adjust Expansions.*

6. Simple Automation Application



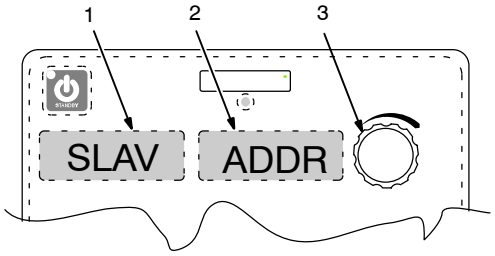
7. Communication Specifications

References: Modbus_Application_Protocol_V1_1b3.pdf
Modbus_over_serial_line_V1_02.pdf

☞ *References available online via search engine.*

Communication Hardware:	2-wire system RS–485
Compliant Standard:	EIA RS–485
Baud Rate:	9600 bps, 19200bps
Maximum Communication Distance:	1200 m
Maximum Number Of Connectable Devices:	31
Transmission Mode:	RTU

8. Modbus Slave Configuration



☞ *See ADVANCED MENU FUNCTIONS in the Dynasty/Maxstar Owner's Manual for additional information on Accessing Tech Menu options.*
The Modbus slave configuration will appear at the end of the Tech Menu.

1 Parameter Display
2 Setting Display
3 Encoder

Rotate Encoder to adjust parameter setting.

[SLAV] Slave Configuration - Right display will flash between slave configuration selection and its' setting. Step through Modbus slave configuration selection using the Dynasty/Maxstar "MENU" or the Dynasty/Maxstar DX "A" button. Rotate encoder to adjust setting.
[ADDR] – Slave Address – 1 (default) – 247 ***NOTICE***: *If more than one slave is set to the same address, an abnormal behavior of the whole serial bus can occur.*
[BAUD] – Slave Baud Rate - 19.2K (default) or 9600 baud.
[PRTY] – Slave Parity - EVEN (default), ODD or NONE.

9. Modbus Implemented Function Codes

Table 5-1. Modbus Function Codes

Function	Code
Read Coils	1
Read Discrete Inputs	2
Read Holding Registers	3
Read Input Registers	4
Write Single Coil	5
Write Single Register	6
Write Multiple Coils	15
Write Multiple Holding Registers	16

10. Modbus Implemented Exception Codes

Table 6-1. Modbus Exception Codes

Exception	Code
Illegal Function	01
Illegal Data Address	02
Illegal Data Value	03
Server Device Failure	04
Server Device Busy	06

11. Modbus Coils, Discrete Inputs, Input Registers, Holding Registers

Notes:

See Dynasty Maxstar Owner's Manual for further understanding of functions controlled by most Modbus Coils, Discrete Inputs, Input Registers and Holding Registers.

Input and Holding Registers with L (Low) and H (High) indicate two 16 bit registers combined to form 32 bit values. Read both L/H paired Input or Holding Registers at the same time to insure valid data values. Write L/H paired Holding Registers with function code "16 - Write Multiple Holding Registers" with address range including both registers. Failure to do so will result in exception response ILLEGAL DATA VALUE.

* Coil, User Interface Disable, may need to be set True to allow "*" marked Coils and Holding Registers to be set without User Interface interference. With User Interface disabled, all "*" marked Coils and Holding Registers should be set for desired function.

** AC capable (Dynasty) power source only.

*** "AC Weld Amperage" (Aw), "AC EN Amperage" (Aen), "AC EP Amperage" (Aep) and "AC Balance"(%bal = % of "AC EN Amperage") are linked together where:

Setting "Aen", "Aep" or "%bal", will set "Aw" with:

Aw = ((Aen * %bal) + (Aep * (1 - %bal)))

Ratio of "Aen" to "Aep" will be stored to be referenced when "Aw" is set.

When setting "Aw":

"Aen" and "Aep" will track their last stored ratio while adjusting "Aw".

"Aw" will effectively be held to limits greater than "Preset Amps Min" or less than "PS Amps Max" when "Aen" or "Aep" reaches either "Preset Amps Min" or "PS Amps Max".

With "Aen" and "Aep" set to the same value, "Aen" and "Aep" will track to the same value set in "Aw".

Table 7-1. Modbus Coils

PDU Address	Coil	Name / Description / Resolution
0000	0001	*User Interface Disable: 1 True / 0 False.
0001	0002	Remote Trigger (14-Skt B / Contactor) Disable: 1 True / 0 False.
0002	0003	Trigger (Contactor) Request: 1 True(1 Second Time Out Return To False) / 0 False. To continue a weld sequence through Final Slope and or Final Time, Coil must be refreshed with False throughout these sequences.
0003	0004	Gas Request: 1 TRUE(1 Second Time Out Return To False) / 0 False.
0004	0005	*,**AC Power Source's Output DC: 1 True (DC) / 0 False (AC).
0005	0006	*,**AC Power Source's DC Polarity EP: 1 True (EP) / 0 False (EN).
0006	0007	*Stuck Check Enable: 1 True / 0 False.
0007	0008	*Hot Start Enable: 1 True / 0 False. Note: Hot Start can also be Disabled with 0 time set in Holding Register 6215 Hot Start Time
0008	0009	*Boost Enable: 1 True / 0 False.
0009	0010	*Droop Enable: 1 True / 0 False.
0010	0011	*Open Circuit Voltage (OCV) Low Enable: 1 True (Low) / 0 False (Normal). OCV selection applies to both Stick and MIG processes.
0011	0012	*Weld Gas Enable: 1 True / 0 False Enables Gas With Contactor.
0012	0013	Non CE Models Only Cooler Power Supply (CPS) Enable: 1 True (Parallel With Coil 0014) / 0 False. Note: Dynasty/Maxstar 210/280 CE Models Have No Control, Read Returns False.
0013	0014	*Cooler Power Supply (CPS) TIG Enable: 1 True (Parallel With Coil 0013) / 0 False TIG Process Control Of Cooler Power Supply.
0014	0015	Dynasty/Maxstar 210/280 Models Only *Cooler Error Enable: 1 True / 0 False Enables Error "1.3.6 No Cooler Detected With Output Current". Error Is Generated When No Load Detected On Cooler Power Supply's Output With Load Detected On The Power Source's Output.
0015	0016	Touch Sense Enable: 1 True / 0 False. Touch Sense Detection found at Modbus Discrete Input 2009 Or Remote 14 Receptacle Socket J.
0016	0017	RMS Enable: AC Amperage Preset And Meter And/Or DC Pulse Amperage Meter:1 True (RMS) / 0 False (Average) Note: To Enable, Must Have Discrete Input 2013 RMS Hardware Detect = True.
0017	0018	*Pulser Enable: 1 True / 0 False. Note: Can also be set TRUE / FALSE when writing values to Holding Register 6305 Pulser Pulses Per Second (PPS). When enabled and Holding Register 6305 PPS is found at "0", PPS will be set to a default value.
0018	0019	Dynasty/Maxstar 400/800 Models Only *AC Commutation Amperage LOW ENABLE: 1 TRUE (LOW) / 0 FALSE (High)
0019	0020	*AC Independent Enable: 1 True / 0 False. Enables/Disables Both Independent Amperage and Independent AC Wave Shapes.
0020	0021	*Weld Timers Enable: 1 True / 0 False. Weld Timers Include Weld (Spot), Intial Amperage and Final Amperage Timers.

Table 7-2. Modbus Discrete Inputs

PDU Address	Discrete Input	Name / Description / Resolution
2000	2001	Dynasty/Maxstar 210/280 Models Only Cooler Power Supply (CPS) Detect: 1 True / 0 False.
2001	2002	Dynasty/Maxstar 210/280 Models Only Cooler Load Detect: 1 True / 0 False.
2002	2003	Foot/Finger Tip Control Detect: 1 True / 0 False Note: Holding Register 6205 (Remote 14-Skt E) Must Be Configured To 0 (Amperage Control) To Detect Foot/Finger Tip Control.
2003	2004	Remote Trigger (Contactor 14-Skt A-B) Enable: 1 True / 0 False.
2004	2005	Contactor Output Enabled: 1 True / 0 False (Contactor Output Or Sense Voltage Pre Contactor Output).
2005	2006	Gas Output Enabled: 1 True / 0 False.
2006	2007	Valid Arc: 1 True / 0 False.
2007	2008	Arc Length Control Lock Out: 1 True / 0 False.
2008	2009	Touch Sense Detect: 1 True / 0 False. Touch Sense Enable (Coil 16) Must Be Set True With Machine's State (Input Register 4101) In Standby, And Weld Output Shorted For Touch Sense Detect To Register As True.
2009	2010	CE Model Detect: 1 True / 0 False
2010	2011	STR Model Detect: 1 True / 0 False
2011	2012	DX Model Detect: 1 True / 0 False
2012	2013	RMS Hardware Detect: 1 True / 0 False
2013	2014	Low Line Detect: 1 True / 0 False (Dynasty/Maxstar 210 Only) Note: Set True When Powered Up On 120 V Input.
2014	2015	Feature Enable for Hot Start Adjust: 1 True / 0 False.
2015	2016	Feature Enable for AC Independent: 1 True / 0 False.
2016	2017	Dynasty/Maxstar 210/280 Models Only Volt Sensing (MIG) Model Detect: 1 True / 0 False
2017	2018	Syncrowave Model Detect: 1 True / 0 False
2018	2019	Syncrowave 300/400 Models Only Non Cooler Supply Detect: 1 True / 0 False

Table 7-3. Modbus Input Registers

PDU Address	Input Registers		Name / Description / Resolution
4016	4017	L	Dynasty/Maxstar 800 Models Only Application Software Number And Revision, 4 Bytes Bit Mapped: NNNN,NNNN NNNN,NNNN NNNN,NNRR RRRE,EEEE NNNN,NNNN NNNN,NNNN NNNN,NN == Miller Part Number, 22 Bits 31 - 10, Bit Range 0 - 4,194,303, Actual 0-999999 RR RRR == Revision Level, 5 Bits 9 - 5, Bit Range 0 - 31, Actual 0 - 26 where: 0 == “@” Preproduction Or Field Test Software 1,2,3... == Revision A,B,C… E,EEEE == Evaluation / Test, 5 Bits 9 - 5, Bit Range 0 - 31, Actual 0 - 26 Where: 0 == ”@” Released Software, 1,2,3... == Evaluation / Test Revision A,B,C… PCB 7 Primary
4017	4018	H	
4018	4019	L	Application Software Number And Revision, PCB 6 Gateway Interface
4019	4020	H	
4020	4021	L	Dynasty/Maxstar 210/280 Models Only Application Software Number And Revision, PCB 5 Cooler Power Supply (CPS)
4021	4022	H	
4022	4023	L	Application Software Number And Revision, PCB 4 Primary
4023	4024	H	
4024	4025	L	Application Software Number And Revision, PCB 3 Process
4025	4026	H	
4026	4027	L	Application Software Number And Revision, PCB 2 User Interface
4027	4028	H	
4028	4029	L	Application Software Number And Revision, PCB 1 SD Card
4029	4030	H	

PDU Address	Input Registers		Name / Description / Resolution
4030	4031	L	Serial Number: 4 Bytes Bit Mapped: DDDY,YYYW WWWW,WSSS SSSS,SSSS SSSB,BBBB DDD = Decade Code, 3 Bits 31 - 29, Bit Range 0 - 7, actual “M” - “U” (For Decades 201*-208*), Skip “O”, See Note Y,YYY = Year Code, 4 Bits 28 - 25, Bit Range 0 - 15, Actual 0 - 9 “A” - “K”, Skip “I”, See Note W WWWW,W = Week Number, 6 Bits 24-19, Bit Range 0 - 63, Actual 01 - 52 SSS SSSS,SSSS SSS = Serialized Number, 14 Bits 18 - 5, Bit Range 0 - 16383, Actual 0001-9999 B,BBBB = Business Unit Code, 5 Bits 4 - 0, Bit Range 0 - 31, Actual 0 - 25 “A”-”Z”, “I” And “O”, Not Used See Note Note: Letters “I” And “O”, Similar To Numbers “1” And “0” Skipped In Decade And Year. Not used In Business Unit Code.
4031	4032	H	
4032	4033		Power Source Configuration, Amperage Maximum: 0-1023, Res: 1A
4033	4034		Power Source Configuration, Amperage DC Minimum: 0-31, Res: 1A, 0 = DC Not Available
4034	4035		Power Source Configuration, Amperage AC Minimum: 0-31, Res: 1A, 0 = AC Not Available
4036	4037	L	Machine’s Software Update Number, Revision. 4 Bytes Bit Mapped: NNNN,NNNN NNNN, NNNN NNNN,NNMM MMML,LLLL NNNN,NNNN NNNN,NNNN NNNN,NN = Miller Part Number, 22 Bits 31–10, Bit Range 0–4,194,303, Actual 0–999999 MM MMM = Revision Level’s Most Significant Designator, 5 Bits 9–5, Bit Range 0–31, Actual 0,1–26 (ASCII “@,A–Z”), 9 “I” & 15 “O” Similar To “1” & “0” Not Used. Typically Starts At 0 (“@”, Omitted When Displayed), Increases By One With Each Wrap “Z” To “A” Of The Least Significant Designator L, LLLL = Revision Level’s Least Significant Designator, 5 Bits 4–0, Bit Range 0–31, Actual 0,1–26 (ASCII “@,A–Z”), 9 “I” & 15 “O” Similar To “1” & “0” Not Used. 0 “@” Used For Preproduction Only.
4037	4038	H	

PDU Address	Input Registers		Name / Description / Resolution
4099	4100		Sequence Timer: Remaining / Elapsed Time of States: Initial Amperage Initial Slope Time Main Amperage Final Slope Time Final Amperage Preflow Postflow (typically timed while in Standby State) Resolution: 0.1 Second
4100	4101		State: 0 Initial Amperage, 1 Initial Slope Time, 2 Main Amperage, 3 Final Slope Time, 4 Final Amperage, 5 Preflow, 6 Standby, 7 Output Shorted, 8 Release Trigger, 9 Output Disabled, 13 Error, 14 Power Down, 15 Power Up
4101	4102		Errors1, 16(Bits) Possible Errors, 1 True / 0 False (Power Source Dependent) Dynasty/Maxstar 210/280, Syncrowave 300 Process And User Interface: Bit / Error# / Description 0 / 0.3.1 / Secondary Over Temp 1 / 0.3.2 / Ambient Over Temp 2 / 7.3.6 / Process Serial Communication With Gateway 3 / 3.3.1 / Secondary Thermistor Failure 4 / 3.3.2 / Ambient Thermistor Failure 5 / 1.3.1 / Fan Failure 6 / 1.3.2 / Clamp/Output Over Voltage 7 / 1.3.3 / AC Commutation Time Out 8 / 1.3.4 / Output Over Voltage 9 / 1.3.5 / Output Current Or Voltage Feedback With Output Off 10 / 1.3.6 / No Cooler Detected With Output Current 11 / 7.3.4 / Process Serial Communication With Primary 12 / 7.3.2 / Process Serial Communication With User Interface 13 / 7.3.1 / Process Serial Communication With Memory Card 14 / 7.3.5 / Process Serial Communication With CPS 15 / 7.2.3 / User Interface Serial Communication With Process Dynasty/Maxstar 400/800: Bit / Error# / Description 0 / 0.3.2 / Ambient Over Temp 1 / 0.3.1 / Secondary Over Temp RC20 2 / 0.3.1 / Secondary Over Temp RC30 3 / 0.4.1 / Primary Power Over Temp 400/800 Top 4 / 0.4.2 or 0.7.1 / Primary Power Over Temp 800 Bottom 5 6 7 8 9 10 11 / 7.3.7 / Process serial communication with Primary 800 Bottom. 12 / 7.3.4 / Process serial communication with Primary 400/800 Top. 13 / 3.3.2 / Ambient thermistor failure 14 / 3.3.1 / Secondary thermistor failure RC20 15 / 3.3.1 / Secondary thermistor failure RC30

PDU Address	Input Registers		Name / Description / Resolution
4102	4103		Errors2, 16(Bits) Possible Errors, 1 True / 0 False (Power Source Dependent) Dynasty/Maxstar 210/280, Syncrowave 300 Primary Bit / Error# / Description 0 / 0.4.1 / Primary Power 1 Over Temp 1 / 0.4.2 / Primary Power 2 Over Temp 2 / 1.4.8 / Ground Current 3 / 1.4.0 / Primary Not Ready 4 / 1.4.1 / Primary Capacitor Imbalance 5 / 1.4.2 / Input Over Voltage 6 / 1.4.3 / Input Over Current 7 / 1.4.4 / Primary Bus Under Voltage 8 / 1.4.5 / Input Under Voltage 9 / 3.4.1 / Primary Power 1 Thermistor Failure 10 / 3.4.2 / Primary Power 2 Thermistor Failure 11 / 7.4.3 / Primary Serial Communication With Process 12 / 1.4.6 / Primary Capacitor Failure 13 / 1.4.7 / Primary Control Power 14 / 0.4.1L / Primary Power 1 Latched Over Temp 15 / 0.4.2L / Primary Power 2 Latched Over Temp Dynasty/Maxstar 400/800, Syncrowave 400: Bit / Error# / Description 0 / 3.4.1 / Primary Power Thermistor Failure 400/800 Top 1 / 3.4.2 or 3.7.1 / Primary Power Thermistor Failure 800 Bottom 2 / 1.3.2 / Clamp/Output over voltage 3 / 1.3.3 / AC Communication time out 4 / 1.3.4 / Output over voltage 5 / 1.3.5 / Output current or voltage feedback with output off 6 / 1.4.8 / Ground current 7 / 1.4.3 / Input over current 400/800 Top 8 / 1.4.3 or 1.7.3 / Input over current 800 Bottom 9 / 1.4.7 / Primary control power 10 / 1.4.5 / Input under voltage 11 / 1.4.4 / Primary bus under voltage 12 / 7.3.6 / Process serial communication with Gateway 13 / 7.3.2 / Process serial communication with User Interface 14 / 7.3.1 / Process serial communication with Memory Card 15 / 7.2.3 / User interface serial communication with Process

PDU Address	Input Registers		Name / Description / Resolution
4103	4104		Errors3, 16(Bits) Possible Errors, 1 True / 0 False (Power Source Dependent) Dynasty Maxstar 210 And 280 CPS Bit / Error# / Description 0 / 0.5.1 / CPS Power Module 1 Over Temp 1 / 0.5.2 / CPS Power Module 2 Over Temp 2 / 0.5.3 / CPS Power Module 3 Over Temp 3 / 1.5.9 / CPS Primary Bus Under Voltage 4 / 7.5.3 / CPS Serial Communication With Process 5 / 3.5.1 / CPS Power Module 1 Thermistor Failure 6 / 3.5.2 / CPS Power Module 2 Thermistor Failure 7 / 3.5.3 / CPS Power Module 3 Thermistor Failure 8 / 1.5.1 / CPS Secondary Bus Under Voltage 9 / 1.5.2 / CPS Output Over Current 10 / 1.5.3 / CPS Secondary Bus Over Voltage 11 / 1.5.4 / CPS Current Or Voltage feedback With CPS off 12 / 1.5.5 / CPS Secondary Control Power 13 / 1.5.6 / CPS Capacitor Imbalance 14 / 1.5.7 / CPS Primary Control Power 15 / 1.5.8 / CPS Secondary Communication With CPS Primary Syncrowave 300: Bit/Error#/Description 3/1.5.9/CPS Primary Bus Under Voltage Dynasty/Maxstar 400/800, Syncrowave 400: Bit/Error#/Description 0 / 1.5.9 / CPS Primary Bus Under Voltage 1 / 1.4.4 / Primary Bus Under Voltage 400/800 Top 2 / 1.4.5 / Input Under Voltage 400/800 Top 3 / 1.4.2 / Input Over Voltage 400/800 Top 4 / 1.4.7 / Primary Control Power 400/800 Top 5 / 7.4.3 / Primary Serial Communication With Process 400/800 Top 6 / 1.4.0 / Primary Not Ready 400/800 Top 7 / 8 / 9 / 1.7.4 / Primary Bus Under Voltage 800 Bottom 10 / 1.7.5 / Input Under Voltage 800 Bottom 11 / 1.7.2 / Input Over Voltage 800 Bottom 12 / 1.7.7 / Primary Control Power 800 Bottom 13 / 7.7.3 / Primary Serial Communication With Process 800 Bottom 14 / 1.7.0 / Primary Not Ready 800 Bottom 15 /

PDU Address	Input Registers		Name / Description / Resolution
4200	4201		Power Source Command Out Amperage, Res: 1A
4201	4202		Power Source Output Current, Res: 1A
4202	4203		Power Source Output Voltage, Res: 0.1V
4203	4204		Power Source Output Current DC Pulse Peak, Res: 1A
4204	4205		Power Source Output Voltage DC Pulse Peak, Res 0.1V
4205	4206		Power Source Output Current DC Pulse Back, Res: 1A
4206	4207		Power Source Output Voltage DC Pulse Back, Res 0.1V
4300	4301		Fan Out, 0(Off) - 100%
4301	4302		Temperature registers (Power Source Dependent): Range: 0 - 254, Resolution: 1 Celsius Offset: -50 (i.e. 50 == 0 Deg. Celsius) Possible Range: -50 - +204 C Actual Range: Limited By Thermistor's Hardware And Software Temperature 1 (Dynasty/Maxstar 210/280, Syncrowave 300 - Primary Power 1) (Dynasty/Maxstar 400/800, Syncrowave 400 - Ambient)
4302	4303		Temperature 2 (Dynasty/Maxstar 210/280, Syncrowave 300 - Primary Power 2) (Dynasty/Maxstar 400/800 Top, Syncrowave 400 - Primary Power)
4303	4304		Temperature 3 (Dynasty/Maxstar 210/280, Syncrowave 300 - Secondary) (Dynasty/Maxstar 800 Bottom - Primary Power)
4304	4305		Temperature 4 (Dynasty/Maxstar 210/280, Syncrowave 300 - Ambient) (Dynasty/Maxstar 400/800, Syncrowave 400 - Secondary RC20)
4305	4306		Temperature 5 (Dynasty/Maxstar 210/280 - CPS Module 1) (Dynasty/Maxstar 400/800, Syncrowave 400 - Secondary RC30)
4306	4307		Temperature 6 (Dynasty/Maxstar 210/280 - CPS Module 2)
4307	4308		Temperature 7 (Dynasty/Maxstar 210/280 - CPS Module 3)
4400	4401		Dynasty/Maxstar 210/280, Syncrowave 300 - Primary Line Current, Res: 1A
4401	4402		Dynasty/Maxstar 210/280, Syncrowave 300 - Primary Line Voltage, Res: 1V
4402	4403		Dynasty/Maxstar 210/280/400/800, Syncrowave 300/400 - Primary Line Voltage Peak, Res: 1V
4403	4404		Dynasty/Maxstar 210/280/400/800, Syncrowave 300/400 - Primary Bus Voltage, Res: 1V
4404	4405		Dynasty/Maxstar 210/280 - Cooler Power Output Voltage, Res: 1V
4405	4406		Dynasty/Maxstar 210/280 - Cooler Power Output Current, Res: 0.1A
4406	4407		Dynasty/Maxstar 210/280 - Cooler Power Bus Voltage, Res: 1V
4407	4408		Dynasty/Maxstar 800 - Primary 2(bottom) Line Voltage Peak, Res: 1V
4408	4409		Dynasty/Maxstar 800 - Primary 2(bottom) Bus Voltage Peak, Res: 1V

Table 7-4. Modbus Holding Registers

PDU Address	Holding Registers		Name / Description / Resolution
6000	6001		Power Source's Modbus Slave Address: 1 - 247.
6001	6002		Fan Request: Dynasty/Maxstar 210/280 0(Off), 1(Min 27%) - 30(Max 100%) Requires Request Of 3 Minimum To Start Fan Dynasty/Maxstar 400/800 0(Off), 1 - 30(Max 100%) Notes: 1 second time out return to 0(Off). Parallel Request With All Machine Thermistors, Where Highest Fan Request Is Used. 0(Off) In This Register Will Not Turn Fan Off With A Fan Request Other Than Off. From Any Machine's Thermistors.
6002	6003		Meter Calibration, Amperage: +-50, Res: 0.1%, (+-50 == +-5.0%) Note: With Discrete Input 2012 RMS Hardware Detect = True, Coil 17 RMS Enable Selects RMS (True) Or Average (False) Amperage Calibration.
6003	6004		Meter Calibration, Voltage Average: +-50, Res: 0.1%, (+-50 == +-5.0%)
6100	6101	L	Arc Time, Res: 0.01 Minute, Maximum: 59999999 == 9999 Hours And 59.99 Minutes.
6101	6102	H	
6102	6103	L	Arc Cycles, Res: 1 Cycle, Maximum: 999999 Cycles.
6103	6104	H	
6200	6201		Dynasty/Maxstar 400/800 Models Only Memory: 0 Memory control off typically defaults to memory 1 with no memory number displayed. 1 - Power Sources memory maximum
6201	6202		*Process: 0 Stick 1 TIG 2 MIG (Selectable only with Dynasty/Maxstar 210/280 Models and Dynasty's Polarity DC) 3 Test 4 Hot Wire
6202	6203		*Process Start: 0 Scratch, 1 Lift, 2 HF.
6203	6204		*Trigger: 0 None-Output Off, 1 Panel-Output ON 2 Standard 3 2T Hold 4 3T Hold 5 4T Hold 6 4TL Mini Logic Hold 7 4TE Momentary Hold 8 4Tm Modified Hold
6204	6205		*Remote 14-skt E Configuration: 0 Amperage Control (Slow Response, Finger Tip/Foot controls) 1 External Pulse Control (Amperage, Fast Response) 2 Output Enable (14-Skt E-D Shorted Enables Power Source Output) 3 Disable (14-Skt E Has No Function)
6205	6206		*Tungsten (Canned Arc Start Parameters): 0 0.020 in. (0.5mm) 1 0.040 in. (1.0mm) 2 1/16 in. (1.6mm) 3 3/32 in. (2.4mm) 4 1/8 in. (3.2mm) 5 5/32 in. (4.0mm) 6 3/16 in. (4.8mm) 7 1/4 in. (6.4mm) 8 General (User Defined With Holding Registers 6207 Through 6212) <9 Power Source Dependent, Typically Used With Process TIG 9 Disabled (Typically Used With Non TIG Processes)
6206	6207		Preset Amperage Minimum: Power Source AC / DC Amperage Minimum - 25A(Tungsten General) Or 63A(Tungsten Disabled), Res 1A Write Only With Tungsten General Or Disabled
6207	6208		Arc Start Amperage: 5A - 200A, Res: 1A Write Only With Tungsten General Or Disabled

PDU Address	Holding Registers		Name / Description / Resolution
6208	6209		Arc Start Time: 0(Off) - 25(x10ms), Res: 1(x10ms) Write Only With Tungsten General
6209	6210		Arc Start Slope Time: 0(Off) - 25(x10ms), Res: 1(x10ms) Write Only With Tungsten General
6210	6211		**Arc Start AC Time: 0(Off) - 25(x10ms), Res: 1(x10ms) Write Only With AC Power Source's AC Output And Tungsten General
6211	6212		**Arc Start Polarity Phase: 1 EP, 0 EN Write Only With AC Power Source And Tungsten General or Disabled
6212	6213		*,**AC EN Wave Shape, 0 Advance Square, 1 Soft Square, 2 Sine, 3 Triangle
6213	6214		*,**AC EP Wave Shape, 0 Advance Square, 1 Soft Square, 2 Sine, 3 Triangle
6214	6215		Hot Start Time: Range: 0(Off) -20 Resolution: 0.1 Second Hot Start Enable / Disabled with Coil 8 Hot Start Enable.
6215	6216		Remote Hold: 0 / 2T 1 / 3T 2 / 4T 3 / 4TL Mini Logic 4 / 4TE Momentary 5 / 4Tm Modified Resolution: 0.1 Second Remote Hold can also be changed with Holding Register 6204 Trigger.
6217	6218		*Dig, 0(Off) - 100%, Res: 1% 101% will set Process Stick for Carbon Arc Gouging, turning Dig off and disabling Boost (Coil 0009). With Processes (Holding Register 6201) MIG selection: *Inductance 0 - 99% Res: 1% 100% will set Inductance and optimize Digital Voltage Control for Flux Core Wire.
6300	6301		*,**,***AC EN Amperage, Preset Amps Min - PS Amps Max, Res: 1A
6301	6302		*,**,***AC EP Amperage, Preset Amps Min - PS Amps Max, Res: 1A
6302	6303		*,**,***AC Balance, 30-99%, Res: 1%
6303	6304		*,**AC Frequency, 20-400Hz, Res: 1Hz
6304	6305		*,***Weld Amperage(DC or AC), Preset Amps Min - PS Amps Max, Res: 1A
6305	6306		*Pulser - Pulses Per Second (PPS) Range: 0(Off) – 50000 / 5000 Power Source Dependent, Resolution: 0.1 Hertz Can be set to a default value when writing a TRUE to coil 18 Pulser Enable and PPS is found at 0(Off). Writing a non "0" value will set coil 18 Pulser Enable to TRUE. Writing a "0" value will set coil 18 Pulser Enable to FALSE. Dependent on configuration of the slave, the slave may or may not retain the PPS non "0" value.
6306	6307		*Pulser - Peak Time, 5-95%, Res: 1%
6307	6308		*Pulser - Background Amperage, 5-95%, Res: 1%
6308	6309		*Prelow Time, 0(Off) - 250, Res: 1(x0.1Sec)
6309	6310		*Initial Amperage, Preset Amps Min - PS Amps Max, Res: 1A
6310	6311		*Initial Time, 0(Off) - 250, Res: 1(x0.1Sec)
6311	6312		*Initial Slope Time, 0(Off) - 500, Res: 1(x0.1Sec)
6312	6313		*Main Time, 0(Off) - 9990, Res: 1(x0.1Sec)
6313	6314		*Final Slope Time, 0(Off) - 500, Res: 1(x0.1Sec)
6314	6315		*Finial Amperage, Preset Amps Min - PS Amps Max, Res: 1A
6315	6316		*Final Time, 0(Off) - 250, Res: 1(x0.1Sec)
6316	6317		*Postflow Time, 0(Off) - 50S & Auto(51), Res: 1Sec
6317	6318		*Dig, 0(Off) - 100%, Res: 1% 101% will set Process Stick for Carbon Arc Gouging, turning Dig off and disabling Boost (Coil 0009).
6318	6319		*Hot Wire Voltage, 5-20, Res: 1V