

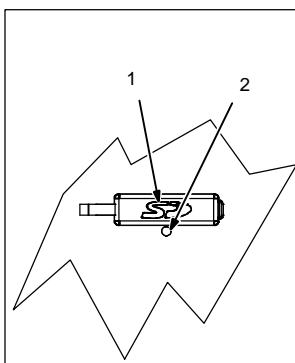


## Dynasty® – Maxstar® 280 Dynasty® – Maxstar® 210 Modbus Expansion



Read and follow the power source Owner's Manual and labels carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.

### 1. 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.

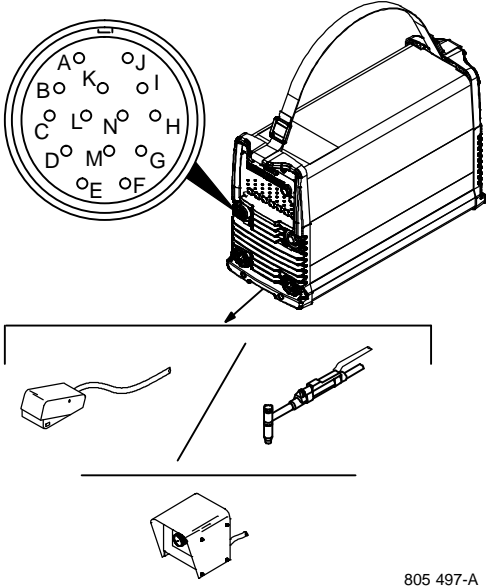

**Modbus Expansion** – Enabling the Modbus expansion configures Remote 14 sockets L, M and N for Modbus control in Dynasty and Maxstar 210 and 280 Models. Modbus serial communication provides access to all front panel parameters and machine functionality. Modbus expansion also includes functionality of Automation(OM-265411), AC Independent Expansion(Dynasty only, OM-267827), and Hot Wire (OM-273 055).

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


☞ Owner's Manuals OM-265415, OM-265411, OM-267827, and OM-273 055 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](http://www.Millerwelds.com)

**Additional Parts Required:** Plug and pins required to connect to the Dynasty or Maxstar 210 or 280 Remote 14 receptacle can be obtained from Miller Electric Mfg. Co. Parts Dept.: Order Part No. 141 162 – Housing Plugs + Pins (service kit), and install according to instructions provided with the kit.

## 2. Remote 14 Receptacle Information

 805 497-A	REMOTE 14	Socket	Socket Information
	<b>15 VOLTS DC</b>  <b>OUTPUT CONTACTOR</b>	A	Contact control +15 volts DC, referenced to G.
B		Contact closure to A completes 15 volts DC contactor control circuit and enables output.	
<b>REMOTE OUTPUT CONTROL</b>	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.	
<b>Output Signals</b>	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	
<b>COMMON</b>	G	Return for all output signals: F, H, I, J and A.	
<b>CHASSIS</b>	K	Chassis	
<b>Serial Communication Bus</b>	L**	Modbus Common (RS485 Common)	
	M**	Modbus D1 (RS485 B+)	
	N**	Modbus D0 (RS485 A-)	

Sockets G and K are electrically isolated 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 and AC Independent Amplitude (Dynasty only) Expansions.

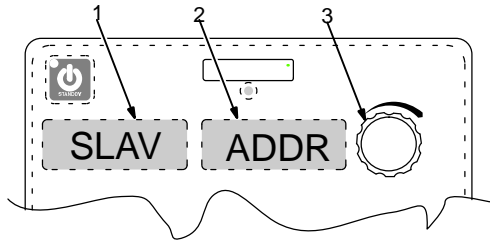
## 3. Communication Specifications

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

## 4. Modbus Slave Configuration



☞ See *ADVANCED MENU FUNCTIONS* in the *Dynasty/Maxstar 210 or Dynasty/Maxstar 280 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 210 or 280 "MENU" or the Dynasty/Maxstar 210DX or 280DX "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.

## 5. 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

## 6. 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

## 7. Modbus Coils, Discrete Inputs, Input Registers, Holding Registers

Notes:

See Dynasty Maxstar 210 or 280 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.
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.
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).
0011	0012	*Weld Gas Enable: 1 True / 0 False Enables Gas With Contactor.
0012	0013	Cooler Power Supply (CPS) Enable: 1 True (Parallel With Coil 0014) / 0 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	*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.
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.

**Table 7-2. Modbus Discrete Inputs**

PDU Address	Discrete Input	Name / Description / Resolution
2000	2001	Cooler Power Supply (CPS) Detect: 1 True / 0 False.
2001	2002	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.

**Table 7-3. Modbus Input Registers**

PDU Address	Input Registers		Name / Description / Resolution
4018	4019	L	Application Software Number And Revision, 4 Bytes Bit Mapped:
4019	4020	H	<p>NNNN,NNNN NNNN,NNNN NNNN,NNRR RRRE,EEEE</p> <p>NNNN,NNNN NNNN,NNNN NNNN,NN == Miller Part Number, 22 Bits 31 - 10, Bit Range 0 - 4,194,303, Actual 0-999999</p> <p>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...</p> <p>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...</p> <p>PCB 6 Gateway Interface</p>
4020	4021	L	Application Software Number And Revision,
4021	4022	H	PCB 5 Cooler Power Supply (CPS)
4022	4023	L	Application Software Number And Revision,
4023	4024	H	PCB 4 Primary
4024	4025	L	Application Software Number And Revision,
4025	4026	H	PCB 3 Process

PDU Address	Input Registers		Name / Description / Resolution
4026	4027	L	Application Software Number And Revision,
4027	4028	H	PCB 2 User Interface
4028	4029	L	Application Software Number And Revision,
4029	4030	H	PCB 1 SD Card
4030	4031	L	Serial Number: 4 Bytes Bit Mapped: DDDY,YYYW WWWWW,SSSS 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 WWWWW,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 0,1-27 (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 0,1-27 (ASCII "@,A-Z"), 9 "I" & 15 "O" Similar To "1" & "0" Not Used. 0 "@" Used For Preproduction Only.
4037	4038	H	
4100	4101		State: 0 Initial Amperage      5 Preflow              13 Error 1 Initial Slope Time      6 Standby             14 Power Down 2 Main Amperage         7 Output Shorted    15 Power Up 3 Final Slope Time      8 Release Trigger 4 Final Amperage        9 Output Disabled

PDU Address	Input Registers	Name / Description / Resolution
4101	4102	<p>Errors1, 16(Bits) Possible Errors, 1 True / 0 False (Power Source Dependent)  Dynasty Maxstar 210 And 280 Process And User Interface:</p> <p>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</p>
4102	4103	<p>Errors2, 16(Bits) Possible Errors, 1 True / 0 False (Power Source Dependent)  Dynasty Maxstar 210 And 280 Primary</p> <p>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</p>
4103	4104	<p>Errors3, 16(Bits) Possible Errors, 1 True / 0 False (Power Source Dependent)  Dynasty Maxstar 210 And 280 CPS</p> <p>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</p>

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 And 280 - Primary Power 1)
4302	4303		Temperature 2 (Dynasty Maxstar 210 And 280 - Primary Power 2)
4303	4304		Temperature 3 (Dynasty Maxstar 210 And 280 - Secondary)
4304	4305		Temperature 4 (Dynasty Maxstar 210 And 280 - Ambient)
4305	4306		Temperature 5 (Dynasty Maxstar 210 And 280 - CPS Module 1)
4306	4307		Temperature 6 (Dynasty Maxstar 210 And 280 - CPS Module 2)
4307	4308		Temperature 7 (Dynasty Maxstar 210 And 280 - CPS Module 3)
4400	4401		Primary Line Current, Res: 1A
4401	4402		Primary Line Voltage, Res: 1V
4402	4403		Primary Line Voltage Peak, Res: 1V
4403	4404		Primary Bus Voltage, Res: 1V
4404	4405		Cooler Power Output Voltage, Res: 1V
4405	4406		Cooler Power Output Current, Res: 0.1A
4406	4407		Cooler Power Bus Voltage, 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, 0(Off), 1(Min 27%) - 30(Max 100%) Notes: 1 Second Time Out Return To 0(Off)  Requires Request Of 3 Minimum To Start Fan 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%)



PDU Address	Holding Registers		Name / Description / Resolution
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	
6201	6202		*Process: 0 Stick, 1 TIG, 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
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
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
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, 0(Off), 1 – 5000, Res: 1(x0.1Hz)
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

<b>PDU Address</b>	<b>Holding Registers</b>	<b>Name / Description / Resolution</b>
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	*Final 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%
6318	6319	*Hot Wire Voltage, 5-20, Res: 1V