Device Profile:	5003	Semiconductor Device Profile
Module Profile:	2060	Temperature Controller
Sub Module Profile	0	
OD_Reference	5003.1 (file: ..\Part_0001_CommonDeviceProfile\ETG5003_1_CDP_OD.xlsx)	
Profile Version:	1	
Test File ID:	18528	0x4860

SEMI Device Profiles

Temperature Controller 2060 **Watlow Additions v0.6**

The object dictionary defined herewith shall be used complementary with ETG.5003-1 and ETG.1000

//0x1xxx		Communication Area										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
0x10F3	RECORD			O		RW					Diagnosis History	Diagnosis History not required

//0x16nn, 0x1Ann		Mapping Area										
// 0x16nn	RECORD										See clause "Process Data" for process Data definition	
// 0x1Ann	RECORD										See clause "Process Data" for process Data definition	

0x04xx		Units										

0x2nnx		Input Data of the Modules Vendor=Watlow										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
0x2nn0	**RECORD**										**Inputs**	
0x2nn0		0x01	BOOL	M		ro	tx				Limit Sensor Error	State of Limit Sensor 0/FALSE: OK 1/TRUE: Error
0x2nn0		0x02	BOOL	M		ro	tx				Optical Sensor Error	State of Optical Sensor 0/FALSE: OK 1/TRUE: Error
0x2nn0		0x03	BOOL	M		ro	tx				Set Point Ramping	State of Set Point Ramp 0/FALSE: Set Point Static 1/TRUE: Set Point Ramping
0x2nn0		0x04	BOOL	M		ro	tx				Open Loop Error	State of Open Loop Detect Error 0/FALSE: No Error 1/TRUE: Open Loop Detected
0x2nn0		0x05	BOOL	M		ro	tx				Line Heater Fault	State of Open Loop Detect Error 0/FALSE: No Error 1/TRUE: There is a heater fault: See 0x2000 SI 0x17 for details
0x2nn0		0x06	BOOL	M		ro	tx				Heater Out of Spec	State of Open Loop Detect Error 0/FALSE: No Error 1/TRUE: Open Loop Detected
0x2nn0		0x07	pad_10								Reserved	
0x2nn0		0x08...0x10									Reserved	Future bit field
0x2nn0		0x11	REAL	C		ro	tx				Optical LED Current	Measures Sensor Process Value If in error return 9999.0
0x2nn0		0x12	UINT	C		ro	tx				Heater Fault Condition	0: No fault Bit 1: Shorted SSR 0x0001 Bit 2: Open SSR 0x0002 Bit 3: Heater Fault High 0x0004 Bit 4: Heater Fault Low 0x0008
0x2nn0		0x13	REAL	C		ro	tx				Watch Variable 1 Value	User defined data watch point 1
0x2nn0		0x14	REAL	C		ro	tx				Limit Sensor Value	Temperature of over temp sensor
0x2nn0		0x15	REAL	C		ro	tx				Internal PCB Temperature	Temperature of the electronics
0x2nn0		0x16	REAL	C		ro	tx				Direct Analog Input	User monitored Analog Input

0x2nn0		0x17	UDINT	C		ro	tx				Heater Faults Details	32 bits of fault indications Bits: Bit 0 - 0x00000001 Resistance Shifted High Bit 1 - 0x00000002 Resistance Shifted Low Bit 2 - 0x00000004 Resistance out of Spec% High Bit 3 - 0x00000008 Resistance out of Spec% Low Bit 4 - 0x00000010 Heater Current High Bit 5 - 0x00000020 Heater Current Low Bit 6 - 0x00000040 FET over temp Bit 7 - 0x00000080 Leakage current shifted high Bit 8 - 0x00000100 Leakage Current shifted low Bit 9 - 0x00000200 Output short detected Bit 10 - 0x00000400 Heater circuit is open Bit 11 - 0x00000800 FET is shorted, power when off
0x2nn0		0x18	REAL	C		ro	tx				Heater Current	Measured RMS current to the heater in Amps
0x2nn0		0x19	REAL	C		ro	tx				Heater Voltage	Measured RMS voltage to the heater in Volts
0x2nn0		0x1A	REAL	C		ro	tx				Heater Resistance	Measured resistance of the heater in Ohms
0x2nn0		0x1B	REAL	C		ro	tx				Heater Wattage	Power level delivered to the heater in Watts = V * I * %OnTime
0x2nn0		0x1C	REAL	C		ro	tx				Leakage Current as Voltage	Indicates leakage to ground
0x2nn0		0x1D	REAL	C		ro	tx				FET Temperature	Temperature of the switching FET
0x2nn0		0x1E	USINT	C		ro	tx				Actual Heater State	0: Idle 1: Ping 2: Startup 3: Ready 4: Startup Fault 5: Running 6: Running Fault 7: Diagnostics 8: Calibration
0x2nn0		0x1F	REAL	C		ro	tx				Actual Heater %Output	0-100% - The power cununtion with of this output
0x2nn0		0x20	USINT	C		ro	tx				Actual Finger Print Number	1 to 4
0x2nn0		0x21	USINT	C		ro	tx				Tune Status	0 = Tune Not Running 1= Tune in progress 2=Tune Completed Successfully 3=Tune Failed >10 Tune sub progress
0x2nn0		0x22	REAL	C		ro	tx				Watch Variable 2 Value	User defined data watch point 2
0x3nnx		Output Data of the Modules Vendor=Watlow										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
0x3nn0	**RECORD**										**Outputs**	
0x3nn0		0x01	BOOL	C		rw	rx				Clear Open Loop Detect	Allows loop to run again after an open loop error is detected 0: No action 1: Clears Open Loop Error
0x3nn0		0x02	BOOL	C		rw	rx				Trigger Fingerprint Transition	Triggers fingerprints that are waiting 0: No action 1: Signal Fingerprint that is waiting
0x3nn0		0x03	BOOL	C		rw	rx				Start Tune	0: No action 1: Start Tune
0x3nn0		0x04	BOOL	C		rw	rx				Stop Tune	0: No action 1: Cancel Tune
0x3nn0		0x05	pad_12								Reserved	
0x3nn0		0x06...0x10									Reserved	Future bit field
0x3nn0		0x11	UINT	C		rw	rx				Clear Limits	Mask to clear 1 to 16 latched limits LSBit=Limit MSBit=Limit16 Mandatory if device supports any alarm
0x3nn0		0x12	REAL	C		rw	rx				Set Variable Value	Set the value of the user defined system variable
0x3nn0		0x13	REAL	C		rw	rx				Remote PV	Remote PV value for control loop
0x3nn0		0x14	REAL	C		rw	rx				Direct Analog Output	User-set Analog Output Value Set to 0V or 0mA during safe states
0x3nn0		0x15	USINT	C		rw	rx				Requested Line Heater State	0: Idle 1: Ping 2: Startup 5: Running 7: Diagnostics 8: Calibration

0x3nn0		0x16	USINT	C		rw	rx				Request Baseline of Readings	0: No action 1: Baseline all readings for this loop 2..7: Reserved
0x3nn0		0x17	USINT	C		rw	rx				Reset Heater Faults	0: No action 1: Reset All Faults 2..7: Reserved
0x3nn0		0x18	USINT	C		rw	rx				Goto Fingerprint Number	Transition to a specific finger print
//0x4nnx		Configuration Data of the Modules Vendor = Watlow										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
0x4nn0	**RECORD**										**I/O Mapping**	
0x4nn0		0x01	pad_16								Reserved	
		0x02...0x10									Reserved	
0x4nn0		0x11	USINT	M		r			0	3	Loop Location	0: Local 1: Remote
0x4nn0		0x12	USINT	M	B	rw			0	4	Sensor Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus 4: Internal Optical Sensor Card 5: Remote PV from 0x3000:0x13
0x4nn0		0x13	USINT	M	B	rw					Sensor Zone	The module containing the sensor for Loop nn
0x4nn0		0x14	USINT	M	B	rw					Sensor Instance	The object instance of the sensor for Loop nn
0x4nn0		0x15	USINT	M	B	rw					Digital Heat Output Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x16	USINT	M	B	rw					Digital Heat Output Zone	The module containing the digital control output for Loop nn
0x4nn0		0x17	USINT	M	B	rw					Digital heat Output Instance	The object instance of the digital control output for Loop nn
0x4nn0		0x18	USINT	M	B	rw					Analog Heat OutputBus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x19	USINT	M	B	rw					Analog Heat Output Zone	The module containing the analog control heat output for Loop nn
0x4nn0		0x1A	USINT	M	B	rw					Analog Heat Output Instance	The object instance of the analog control heat output for Loop nn
0x4nn0		0x1B	USINT	M	B	rw					Over-Temp Limit Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x1C	USINT	M	B	rw					Over-Temp Limit Zone	The module containing the Over-Temp Limit for Loop nn
0x4nn0		0x1D	USINT	M	B	rw					Over-Temp Limit Instance	The object instance for the Over-Temp Limit for Loop nn
0x4nn0		0x1E	USINT	M	B	rw					Current Sense Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x1F	USINT	M	B	rw					Current Sense Zone	The module containing the current transformer assocated with Loop nn
0x4nn0		0x20	USINT	M	B	rw					Current Sense Instance	The object instance of the current transformer assocated with Loop nn
0x4nn0		0x21	USINT	M	B	rw					Watch Variable 1 Zone	The module containing the User definable arbitrary data point to watch
0x4nn0		0x22	USINT	M	B	rw					Watch Variable 1 Class	The feature class being observed by the watch point.
0x4nn0		0x23	USINT	M	B	rw					Watch Variable 1 Member	The member within the class being observed by the watch point.
0x4nn0		0x24	USINT	M	B	rw					Watch Variable 1 Instance	The instance of the feature class being observed by the watch point.
0x4nn0		0x25	USINT	M	B	rw					Analog Retransmit Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x26	USINT	M	B	rw					Analog PV Retransmit Zone	The module containing the analog PV retransmission for Loop nn
0x4nn0		0x27	USINT	M	B	rw					Analog PV Retransmit Instance	The object instance of the analog PV retransmission for Loop nn
0x4nn0		0x28	USINT	M	B	rw					Digital Cool Output Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x29	USINT	M	B	rw					Digital Cool Output Zone	The module containing the Digital Cool Output for Loop nn
0x4nn0		0x2A	USINT	M	B	rw					Digital Cool Output Instance	The object instance of the Digital Cool Output Loop nn

0x4nn0		0x2B	USINT	M	B	rw					Alarm 1 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x2C	USINT	M	B	rw					Alarm 1 Zone	The module containing the Alarm 1 Output for Loop nn
0x4nn0		0x2D	USINT	M	B	rw					Alarm 1 Instance	The object instance of the Alarm 1 Output Loop nn
0x4nn0		0x2E	USINT	M	B	rw					Alarm 2 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus SL-10
0x4nn0		0x2F	USINT	M	B	rw					Alarm 2 Zone	The module containing the Alarm 2 Output for Loop nn
0x4nn0		0x30	USINT	M	B	rw					Alarm 2 Instance	The object instance of the Alarm 2 Output Loop nn
0x4nn0		0x31	USINT	M	B	rw					Limit Output Instance	Output in the RML module associated with the limit
0x4nn0		0x32	USINT	M	B	rw					Analog Cooling Output Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x33	USINT	M	B	rw					Analog Cooling Output Zone	The module containing the Analog Cooling Output for Loop nn
0x4nn0		0x34	USINT	M	B	rw					Analog Cooling Output Instance	The object instance of the Analog Cooling Output Loop nn
0x4nn0		0x35	USINT	M	B	rw					Direct Digital Input Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x36	USINT	M	B	rw					Direct Digital Input Zone	The module containing the Digital Input to be directly read in 0x6nn0
0x4nn0		0x37	USINT	M	B	rw					Direct Digital Input Instance	The object instance of the Digital Input for Loop nn
0x4nn0		0x38	USINT	M	B	rw					Direct Digital Output Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x39	USINT	M	B	rw					Direct Digital Output Zone	The module containing the Digital Output to directly drive from 0x7nn0
0x4nn0		0x3A	USINT	M	B	rw					Direct Digital Output Instance	The object instance of the Digital Output Loop nn
0x4nn0		0x3B	USINT	M	B	rw					Direct Analog Input Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x3C	USINT	M	B	rw					Direct Analog Input Zone	The module containing the Analog Input to be directly read in 0x2nn0
0x4nn0		0x3D	USINT	M	B	rw					Direct Analog Input Instance	The object instance of the Direct Analog Input for Loop nn
0x4nn0		0x3E	USINT	M	B	rw					Direct Analog Output Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x3F	USINT	M	B	rw					Direct Analog Output Zone	The module containing the Analog Output to directly drive from 0x3nn0 for Loop nn
0x4nn0		0x40	USINT	M	B	rw					Direct Analog Output Instance	The object instance of the Direct Analog Output Loop nn
0x4nn0		0x41	USINT	M	B	rw					Line Heating Output Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x4nn0		0x42	USINT	M	B	rw					Line Heating Output Zone	The module containing the line heating output drive from0x4nn2 object
0x4nn0		0x43	USINT	M	B	rw					Line Heating Output Instance	The output number on the line heating output device from0x4nn2 object (value 1 to 4)
0x4nn0		0x44	USINT	M	B	rw					Limit Configuration Level	Determines how much of the limit functionality in the limit controller, like the RML, is managed by this RMZ. 0: The limit is fully configured and monitored from the RMZ 1: The limit is not configured, only monitored for temperature limit conditions can be monitor and limited cleared. 2: The limit may only be monitored (Temperature and limit condition). They are not configured and cannot be cleared from the RMZ.
0x4nn0		0x45	USINT	M	B	rw					Watch Variable 2 Zone	The module containing the User definable arbitrary data point to watch
0x4nn0		0x46	USINT	M	B	rw					Watch Variable 2 Class	The feature class being observed by the watch point.
0x4nn0		0x47	USINT	M	B	rw					Watch Variable 2 Member	The member within the class being observed by the watch point.
0x4nn0		0x48	USINT	M	B	rw					Watch Variable 2 Instance	The instance of the feature class being observed by the watch point.
0x4nn0		0x49	USINT	M	B	rw					Sensor Source	Selects with sensor source within a zone is used: 0: Off 1: Analog Input (normal sensor input) 2: Math Block (for cascade) 3: PV Block (for sensor backup, average, crossover…)

//Feature Configuration Bank 1 for Loop nn												
0x4nn1	**RECORD**										**Configuration Parameters**	
0x4nn1		0x11	USINT	M	B	rw					RTD Wires	2: 2 wire RTD 3: 3 Wire RTD
0x4nn1		0x12	USINT	M	B	rw					Cool Algorithm	0: Off 1: PID 2: On-Off
0x4nn1		0x13	USINT	M	B	rw					Cool Hysteresis	Switching Hysteresis for On-Off Cool Algorithm
0x4nn1		0x14	USINT	M	B	rw					Optical sensor Type	0: Osensa Type X 1: Photon Type Y
0x4nn1		0x15	USINT	M	B	rw					Limit Function	0: Disabled 1: High Only 2: Low Only 3: Both High and Low Trip Enabled
0x4nn1		0x16	REAL	M	B	rw					Limit Hysteresis	Switching Hysteresis for the Over-Temp
0x4nn1		0x17	REAL	M	B	rw					Limit Set Point Upper Bound	The limit set points upper bound
0x4nn1		0x18	REAL	M	B	rw					Limit Set Point Lower Bound	The limit set points lower bound
0x4nn1		0x19	USINT	M	B	rw					Heater Failure Function	0: Disabled 1: High Only 2: Low Only 3: Both High and Low Trip Enabled
0x4nn1		0x1A	REAL	M	B	rw					High Heater Current Trip Point	Current level to create a High Heater Fault condition
0x4nn1		0x1B	REAL	M	B	rw					Low Heater Current Trip Point	Current level to create a Low Heater Fault condition
0x4nn1		0x1C	REAL	M	B	rw					CT Scaling High	CT Current corresponding to 50mA from CT
0x4nn1		0x1D	REAL	M	B	rw					CT User Offset	Calibration offset for CT
0x4nn1		0x1E	USINT	M	B	rw					Limit Sensor Type	Type of sensor being measured 0:TC 1: RTD100 2: RTD1000 3: 4-20mA 4: 0-20mA 5: 0-10V 6-31 Reserved
0x4nn1		0x1F	USINT	M	B	rw					Limit TC Type	Thermocouple Type 0: K 1: J 2: T 3: E 4: N 5: R 6: S 7: B 8: C 9: D 10: F 11-31 reserved
0x4nn1		0x20	USINT	M	B	rw					Ramp To Set Point Enable	0: Off 1: Start Up 2: Set Point Change 3: Both
0x4nn1		0x21	REAL	M	B	rw					Ramp To Set Point Rate	Deg / Min
0x4nn1		0x22	USINT	M	B	rw					Heat Analog Output Type	0=Milliamps 1=Volts
0x4nn1		0x23	REAL	M	B	rw					Heat Analog Ouput Electrical High	Electrical Units corresponding to 100% heater power such as 20ma, 10V etc
0x4nn1		0x24	REAL	M	B	rw					Heat Analog Ouput Electrical Low	Electrical Units corresponding to 0% heater power such as 0ma, 4ma, 0V etc
0x4nn1		0x25	USINT	M	B	rw					Cool Analog Output Type	0=Milliamps 1=Volts
0x4nn1		0x26	REAL	M	B	rw					Cool Analog Ouput Electrical High	Electrical Units corresponding to 100% cooling power such as 20ma, 10V etc
0x4nn1		0x27	REAL	M	B	rw					Cool Analog Ouput Electrical Low	Electrical Units corresponding to 0% cooling power such as 0ma, 4ma, 0V etc
0x4nn1		0x28	USINT	M	B	rw					Retransmit Analog Output Type	0=Milliamps 1=Volts
0x4nn1		0x29	REAL	M	B	rw					Retransmit Analog Ouput Scale High	Process Units corresponding to High Electrical Units such as 200 degrees C.
0x4nn1		0x2A	REAL	M	B	rw					Retransmit Analog Ouput Scale Low	Process Units corresponding to Low Electrical Units such as 20 degrees C
0x4nn1		0x2B	REAL	M	B	rw					Retransmit Analog Ouput Electrical High	Electrical Units corresponding to Process Scale High such as 20ma, 10V etc
0x4nn1		0x2C	REAL	M	B	rw					Retransmit Analog Ouput Electrical Low	Electrical Units corresponding to Process Scale Low such as 0ma, 4ma, 0V etc

0x4nn1		0x2D	REAL	M	B	rw					Heat-Cool Deadband	Seperation(+) or overlap(-) of the heating and cooling regions.
0x4nn1		0x2E	REAL	M	B	rw					Optical LED Current Warning Point	Optical LED current waring point where Status Indicator flashes warning
0x4nn1		0x2F	USINT	M	B	rw					Open Loop Enable	0: Not enabled 1: Enabled
0x4nn1		0x30	REAL	M	B	rw					Open Loop Detect Time	Time for power to be at 100% without a increase for the error to occur
0x4nn1		0x31	REAL	M	B	rw					Open Loop Deviation	Temperature movement threshold to prevent open loop detect when power is 100%
0x4nn1		0x32	USINT	M	B	rw					Direct Analog Input Sensor Type	Type of sensor being measured 0:TC 1: RTD100 2: RTD1000 3: 4-20mA 4: 0-20mA 5: 0-10V 6-31 Reserved
0x4nn1		0x33	USINT	M	B	rw					Direct Analog Input TC Type	Thermocouple Type 0: K 1: J 2: T 3: E 4: N 5: R 6: S 7: B 8: C 9: D 10: F 11-31 reserved
0x4nn1		0x34	REAL	C	B	rw					Process Scale High for Direct Analog Input	Process value corresponding to an Electrical Scale Low signal Mandatory if configurable inputs supported
0x4nn1		0x35	REAL	C	B	rw					Process Scale Low for Direct Analog Input	Process value corresponding to an Electrical Scale High signal Mandatory if configurable inputs supported
0x4nn1		0x36	REAL	C	B	rw					Process Scale High for Limit Input	Process value corresponding to an Electrical Scale Low signal Mandatory if configurable inputs supported
0x4nn1		0x37	REAL	C	B	rw					Process Scale Low for Limit Input	Process value corresponding to an Electrical Scale High signal Mandatory if configurable inputs supported
0x4nn1		0x38	REAL	C	B	rw					Control Output Power Scaling High	PID 100% power will scale to this value. Power levels between 0 and 100% will be an interpolated scale.
0x4nn1		0x39	REAL	C	B	rw					Control Output Power Scaling Low	PID 0% power will scale to this value
0x4nn1		0x3A	REAL	C	B	rw					Control Sensor Filter Time Constant	0.0 = no filter X.X = first order low pass time constant in seconds
0x4nn1		0x3B	REAL	C	B	rw					Alarm 1 Hysteresis	0.01 to 9999
0x4nn1		0x3C	REAL	C	B	rw					Alarm 2 Hysteresis	0.01 to 9999

//Feature Line Heating Setup for Loop nn												
0x4nn2	**RECORD**										**Line Heating Setup**	
0x4nn2		0x11	USINT	M	B	rw					Initial Heater Control State	The controller will advance to this state on power up. 0: Idle 2: Startup 5: Running
0x4nn2		0x12	REAL	M	B	rw					Output Power Scale High	Sets max output duty cycle %power for the heater output, default=25%
0x4nn2		0x13	REAL	M	B	rw					Output Power Scale Low	Sets min output duty cycle %power for the heater output, default=0%
0x4nn2		0x14	REAL	M	B	rw					Baseline Heater Current	The learned heater current for comparision
0x4nn2		0x15	REAL	M	B	rw					Baseline Heater Resistance	The learned heater resistance for comparision
0x4nn2		0x16	REAL	M	B	rw					Baseline Heater Leakage	The learned heater leakage as a reference voltage for comparision
0x4nn2		0x17	REAL	M	B	rw					Resistance Positive Drift Allowed (Relative)	Ohms allowed above resistance baseline
0x4nn2		0x18	REAL	M	B	rw					Resistance Negative Drift Allowed (Relative)	Ohms allowed below resistance baseline
0x4nn2		0x19	REAL	M	B	rw					Resistance Spec High %(Absolute)	%ohms above the expected resistance for a fault
0x4nn2		0x1A	REAL	M	B	rw					Resistance Spec Low %(Absolute)	%ohms below the expected resistance for a fault
0x4nn2		0x1B	REAL	M	B	rw					Current Spec High (Absolute)	Amps above baselined current for a fault
0x4nn2		0x1C	REAL	M	B	rw					Current Spec Low (Absolute)	Amps below baselined current for a fault
0x4nn2		0x1D	REAL	M	B	rw					Max Leakage (Relative)	Leakage conduction above baseline (toward +Rail)of leakage detect for a fault
0x4nn2		0x1E	REAL	M	B	rw					Min Leakage (Relative)	Leakage conduction below baseline (toward -Rail)of leakage detect for a fault
0x4nn2		0x1F	REAL	M	B	rw					Device Over-Temperature Point	Temperature where FET device over temp fault is generated
0x4nn2		0x20	REAL	M	B	rw					Load Current Filter Time	First order filter time for measured current
0x4nn2		0x21	REAL	M	B	rw					Load Voltage Filter Time	First order filter time for measured voltage
0x4nn2		0x22	REAL	M	B	rw					Load Resistance Filter Time	First order filter time for measured resistance
0x4nn2		0x23	REAL	M	B	rw					Load Wattage Filter Time	First order filter time for measured resistance
0x4nn2		0x24	REAL	M	B	rw					Expected Resistance	The entered expected resistance for zone for comparision
0x4nn2		0x25	UINT	M	B	rw					Fault Enables	Faults shut off controller outputs when this occurs. Indication is controlled by 0x4002:0x26 By Bit: 0x0001 Shorted Ouput Fault Enable 0x0002 Open Output Fault Enable 0x0004 Leakage Fault Enable 0x0008 Heater Current Level Fault Enabled 0x0010 Heater Resistance Shift from Baseline Fault Enabled 0x0020 Heater Resistance off expected by % 0x0040 Switching Device Over-Temp Fault Enabled
0x4nn2		0x26	UINT	M	B	rw					Warning Enables	Warnings indicate in 0x2000:0x17 while continuing to operate. By Bit: 0x0001 Shorted Ouput Warning Enable 0x0002 Open Output Warning Enable 0x0004 Leakage Warning Enable 0x0008 Heater Current Level Warning Enabled 0x0010 Heater Resistance Shift from Baseline Warning Enabled 0x0020 Heater Resistance off expected by % 0x0040 Switching Device Over-Temp Warning Enabled
//Feature Fingerprinting Setup for Loop nn												
0x4nn3	**RECORD**										**Fingerprinting Parameters**	
// Finger Print 1												
0x4nn3		0x11	USINT	M	B	rw					Start Action	0: PID continues 1: Preload Integral I=Factor 2: Scale Integral I=I*Factor 3: Offset Integral I=I+Factor 4: Manual Mode %Power=factor
0x4nn3		0x12	REAL	M	B	rw					Factor	For Scaling or Loading or offseting
0x4nn3		0x13	REAL	M	B	rw					Propband	
0x4nn3		0x14	REAL	M	B	rw					Integral	
0x4nn3		0x15	REAL	M	B	rw					Derivative	
0x4nn3		0x16	USINT	M	B	rw					Transition Method	0: PV > Value 1: PV < Value 2: DirectAin > Value 3: DirectAin < Value 4: Time >= Value ni seconds 5: DirectDin = True 6: DirectDin = False 7: 0x3000:0xxx trigger input = 1 8: Hold

0x4nn3		0x17	REAL	M	B	rw					Transition Value	Comparision Value
0x4nn3		0x18	USINT	M	B	rw					Next Print	New Target Fingerprint for transition
// Finger Print 2												
0x4nn3		0x21	USINT	M	B	rw					Start Action	0: PID continues 1: Preload Integral I=Factor 2: Scale Integral I=I*Factor 3: Offset Integral I=I+Factor 4: Manual Mode %Power=factor
0x4nn3		0x22	REAL	M	B	rw					Factor	For Scaling or Loading or offseting
0x4nn3		0x23	REAL	M	B	rw					Propband	
0x4nn3		0x24	REAL	M	B	rw					Integral	
0x4nn3		0x25	REAL	M	B	rw					Derivative	
0x4nn3		0x26	USINT	M	B	rw					Transition Method	0: PV > Value 1: PV < Value 2: DirectAin > Value 3: DirectAin < Value 4: Time >= Value ni seconds 5: DirectDin = True 6: DirectDin = False
0x4nn3		0x27	REAL	M	B	rw					Transition Value	Comparisoin Value
0x4nn3		0x28	USINT	M	B	rw					Next Print	New Target Fingerprint for transition
// Finger Print 3												
// Finger Print 4												
Feature Configuration Bank 4												
0x4nn4												
Alarm Group Setup and Mapping												
0x5F00	**RECORD**											
0x5F00		0x01	BOOL	M		ro	tx				Alarm Group 1 Value	Indicates if the Alarm Group 1 is active. Follows alarm group 1 logic.
0x5F00		0x02	BOOL	M		ro	tx				Alarm Group 2 Value	Indicates if the Alarm Group 2 is active. Follows alarm group 2 logic.
0x5F00		0x03	BOOL	M		ro	tx				Alarm Group 3 Value	Indicates if the Alarm Group 3 is active. Follows alarm group 3 logic.
0x5F00		0x04	BOOL	M		ro	tx				Alarm Group 4 Value	Indicates if the Alarm Group 4 is active. Follows alarm group 4 logic.
0x5F00		0x05	BOOL	M		ro	tx				Alarm Group 5 Value	Indicates if the Alarm Group 1 is active. Follows alarm group 1 logic.
0x5F00		0x06	BOOL	M		ro	tx				Alarm Group 6 Value	Indicates if the Alarm Group 2 is active. Follows alarm group 2 logic.
0x5F00		0x07	BOOL	M		ro	tx				Alarm Group 7 Value	Indicates if the Alarm Group 3 is active. Follows alarm group 3 logic.
0x5F00		0x08	BOOL	M		ro	tx				Alarm Group 8 Value	Indicates if the Alarm Group 4 is active. Follows alarm group 4 logic.
0x5F00		0x09	pad_8								Reserved	
0x5F00		0x0A...0x10									Reserved	
0x5F00		0x11	USINT	M	B	rw					Alarm Group 1 Logic	0: If any alarm condition is met, the alarm output is TRUE 1: If any alarm condition is met, the alarm output is FALSE
0x5F00		0x12	USINT	M	B	rw					Alarm Group 1 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x5F00		0x13	USINT	M	B	rw					Alarm Group 1 Zone	0: Not Mapped 1..16: Zone hosting group alarm output
0x5F00		0x14	USINT	M	B	rw					Alarm Group 1 Instance	0: Not Mapped 1..250: Output Instance in Output Hosting Module
0x5F00		0x15	USINT	M	B	rw					Alarm Group 2 Logic	0: If any alarm condition is met, the alarm output is TRUE 1: If any alarm condition is met, the alarm output is FALSE
0x5F00		0x16	USINT	M	B	rw					Alarm Group 2 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x5F00		0x17	USINT	M	B	rw					Alarm Group 2 Zone	0: Not Mapped 1..16: Zone hosting group alarm output
0x5F00		0x18	USINT	M	B	rw					Alarm Group 2 Instance	0: Not Mapped 1..250: Output Instance in Output Hosting Module
0x5F00		0x19	USINT	M	B	rw					Alarm Group 3 Logic	0: If any alarm condition is met, the alarm output is TRUE 1: If any alarm condition is met, the alarm output is FALSE
0x5F00		0x1A	USINT	M	B	rw					Alarm Group 3 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x5F00		0x1B	USINT	M	B	rw					Alarm Group 3 Zone	0: Not Mapped 1..16: Zone hosting group alarm output

0x5F00		0x1C	USINT	M	B	rw					Alarm Group 3 Instance	0: Not Mapped 1..250: Output Instance in Output Hosting Module
0x5F00		0x1D	USINT	M	B	rw					Alarm Group 4 Logic	0: If any alarm condition is met, the alarm output is TRUE 1: If any alarm condition is met, the alarm output is FALSE
0x5F00		0x1E	USINT	M	B	rw					Alarm Group 4 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x5F00		0x1F	USINT	M	B	rw					Alarm Group 4 Zone	0: Not Mapped 1..16: Zone hosting group alarm output
0x5F00		0x20	USINT	M	B	rw					Alarm Group 4 Instance	0: Not Mapped 1..250: Output Instance in Output Hosting Module
0x5F00		0x21	USINT	M	B	rw					Alarm Group 5 Logic	0: If any alarm condition is met, the alarm output is TRUE 1: If any alarm condition is met, the alarm output is FALSE
0x5F00		0x22	USINT	M	B	rw					Alarm Group 5 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x5F00		0x23	USINT	M	B	rw					Alarm Group 5 Zone	0: Not Mapped 1..16: Zone hosting group alarm output
0x5F00		0x24	USINT	M	B	rw					Alarm Group 5 Instance	0: Not Mapped 1..250: Output Instance in Output Hosting Module
0x5F00		0x25	USINT	M	B	rw					Alarm Group 6 Logic	0: If any alarm condition is met, the alarm output is TRUE 1: If any alarm condition is met, the alarm output is FALSE
0x5F00		0x26	USINT	M	B	rw					Alarm Group 6 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x5F00		0x27	USINT	M	B	rw					Alarm Group 6 Zone	0: Not Mapped 1..16: Zone hosting group alarm output
0x5F00		0x28	USINT	M	B	rw					Alarm Group 6 Instance	0: Not Mapped 1..250: Output Instance in Output Hosting Module
0x5F00		0x29	USINT	M	B	rw					Alarm Group 7 Logic	0: If any alarm condition is met, the alarm output is TRUE 1: If any alarm condition is met, the alarm output is FALSE
0x5F00		0x2A	USINT	M	B	rw					Alarm Group 7 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x5F00		0x2B	USINT	M	B	rw					Alarm Group 7 Zone	0: Not Mapped 1..16: Zone hosting group alarm output
0x5F00		0x2C	USINT	M	B	rw					Alarm Group 7 Instance	0: Not Mapped 1..250: Output Instance in Output Hosting Module
0x5F00		0x2D	USINT	M	B	rw					Alarm Group 8 Logic	0: If any alarm condition is met, the alarm output is TRUE 1: If any alarm condition is met, the alarm output is FALSE
0x5F00		0x2E	USINT	M	B	rw					Alarm Group 8 Bus	0: Unused 1: RM 2: Legacy ST/PM 3: Modbus
0x5F00		0x2F	USINT	M	B	rw					Alarm Group 8 Zone	0: Not Mapped 1..16: Zone hosting group alarm output
0x5F00		0x30	USINT	M	B	rw					Alarm Group 8 Instance	0: Not Mapped 1..250: Output Instance in Output Hosting Module
Alarm Group Pick Lists	**ARRAY**											
0x5F01		0x00..0xFF	USINT	M	B	rw					Pick if the channel seleted (via SI) is part of group 1.	0 not picked 1 Process=True 2 Process=False 3 Deviation=True 4 Deviation=False 5 Process and Deviation=True 6 Process or Deviation=True

0x5F02		0x00..0xFF	USINT	M	B	rw					Pick if the channel seleted (via SI) is part of group 2.	0 not picked 1 Process=True 2 Process=False 3 Deviation=True 4 Deviation=False 5 Process and Deviation=True 6 Process or Deviation=True
0x5F03		0x00..0xFF	USINT	M	B	rw					Pick if the channel seleted (via SI) is part of group 3.	0 not picked 1 Process=True 2 Process=False 3 Deviation=True 4 Deviation=False 5 Process and Deviation=True 6 Process or Deviation=True
0x5F04		0x00..0xFF	USINT	M	B	rw					Pick if the channel seleted (via SI) is part of group 4.	0 not picked 1 Process=True 2 Process=False 3 Deviation=True 4 Deviation=False 5 Process and Deviation=True 6 Process or Deviation=True
0x5F05		0x00..0xFF	USINT	M	B	rw					Pick if the channel seleted (via SI) is part of group 5.	0 not picked 1 Process=True 2 Process=False 3 Deviation=True 4 Deviation=False 5 Process and Deviation=True 6 Process or Deviation=True
0x5F06		0x00..0xFF	USINT	M	B	rw					Pick if the channel seleted (via SI) is part of group 6.	0 not picked 1 Process=True 2 Process=False 3 Deviation=True 4 Deviation=False 5 Process and Deviation=True 6 Process or Deviation=True
0x5F07		0x00..0xFF	USINT	M	B	rw					Pick if the channel seleted (via SI) is part of group 7.	0 not picked 1 Process=True 2 Process=False 3 Deviation=True 4 Deviation=False 5 Process and Deviation=True 6 Process or Deviation=True
0x5F08		0x00..0xFF	USINT	M	B	rw					Pick if the channel seleted (via SI) is part of group 8.	0 not picked 1 Process=True 2 Process=False 3 Deviation=True 4 Deviation=False 5 Process and Deviation=True 6 Process or Deviation=True
0x5FF0	**RECORD**										**Global Actions**	
0x5FF0		0x01	BOOL	M		rw					Global Loop State	Set Loop State in all slots (will need to have disabled fixed POD which also set this)
0x5FF0		0x02	BOOL	M		rw					Global Lope Mode	Set Loop Mode in all slots (will need to have disabled fixed POD which also set this)
0x5FF0		0x03	BOOL	M		r					Global Limit Status	Indicates True(1) if any limit mapped slot has a limit condition
0x5FF0		0x04	BOOL	M		rw					Global Limit Clear	Write a 1 to clear all latched over temp limits
0x5FF0		0x05	BOOL	M		rw					Global Start Tune on all loops	Write a 1 to start tune an all channels
0x5FF0		0x06	BOOL	M		rw					Global Cancel Tune on all loops	Write a 1 to stop all running autotunes
0x5FF0		0x07	BOOL	M		rw					Global All Loops Have Been Tuned	Indicates if all loops have been tuned at least once. This can be cleared by the user and will be saved with Non-Volatile parameters.
0x5FF0		0x08	BOOL	M		r					Global Open Loop Detect Status	Indicates True(1) if any slot has a open loop condition, per open loop detect setup for that loop
0x5FF0		0x09	BOOL	M		rw					Global Open Loop Detect Clear	Write a 1 to clear all open loop faults
0x5FF0		0x0A	BOOL	M		r					Global Alarm Status	Indicates True(1) if any slot with a configured alarm has an alarm condition
0x5FF0		0x0B	BOOL	M		rw					Global Alarm Clear	Write a 1 to clear all latched alarms
0x5FF0		0x0C	BOOL	M		r					Global Line Heat Fault	Indicates True(1) if any slot with a configured alarm has an line heating fault
0x5FF0		0x0D	BOOL	M		rw					Global Line Heat Reset	Write a 1 to clear all line heating faults
0x5FF0		0x0E	BOOL	M		rw					Save NonVolatile	Write a 1 to clear all line heating faults

0x5FF0		0x0F...0x10									reserved	
0x5FF0		0x11	USINT	M		r					Global Tune Status	Returns: 0: No Loops tuning 1: One or more loops is tuning supersedes 2 and 3 until all are complete) 2: All loops that were requested to tune have complete successfully 3: One or more loops that were requested to tune failed to complete successfully
0x5FF0		0x12	USINT	M		r					NV Save Status	Returns: 0: Idle 1: Save In Progress 2: Save Complete 3: Save Failed
0x6nnx		Input Data of the Modules										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
0x6nn0	**RECORD**										**Inputs (float)**	
0x6nn0		0x01	BOOL	M		ro	tx				Actual Control State	Indicates if the control loop is active FALSE: Off TRUE: Running
0x6nn0		0x02	BOOL	M		ro	tx				Actual Control Loop Mode	Current mode of the control loop FALSE:Auto TRUE:Manual 0: Auto 1: Manual
0x6nn0		0x03	BOOL	O		ro	tx				Sensor Error	Process value validity FALSE=Ok TRUE=Sensor Failure 0: no error 1: error
0x6nn0		0x04	BOOL	C		ro	tx				Tune Occurring	Indicates tune activity (Moved to Information) Mandatory if automatic tune supported 0=Not tuning 1=Tuning
0x6nn0		0x05	pad_8								Reserved	
0x6nn0		0x06...0x0C									Reserved	
0x6nn0		0x0D	BOOL	C		RO	tx				new message in diagnosis history	Mandatory if diag hisotry supported
0x6nn0		0x0E	BOOL	M		RO	tx				TxPdoState	Indicates that this module is reporting correctly FALSE=OK TRUE=Module Fault
0x6nn0		0x0F	BIT2	C		RO	tx				Input Cycle Counter	Mandatory if DC supported Incremented by the slave with each cycle. The master can determin if the slave is synchronous to the bus cycle
0x6nn0		0x10									Reserved	
0x6nn0		0x11	REAL	M		ro	tx				Process Value	Measures Sensor Process Value If in error return FLOAT_MAX
0x6nn0		0x12	REAL	M		ro	tx				Manipulated Value (Control Output)	Total output control signal (heat+cool) -100.0-100.0%
0x6nn0		0x13	REAL	M		ro	tx				Heat Manipulated Value	Heat output control signal 0.0-100.0%
0x6nn0		0x14	REAL	C		ro	tx				Cool Manipulated Value	Cool output control signal Mandatory if cooling outputs (direct acting) supported -100.0-100.0%
0x6nn0		0x15	REAL	C		ro	tx				Current Transfomer reading	Current transformer reading Mandatory if current measurement supported
0x6nn0		0x16	REAL	M		ro	tx				Controlling Set Point	Closed loop auto setpoint in effect
0x6nn0		0x17	UINT	C		ro	tx				Alarm Condition	16 bit, 1 per alarm, LSB aligned Bit 1: Bit 2: Bit 3: .... Mandatory if primary alarm or second alarm supported
0x6nn0		0x18	UINT	C		ro	tx				Limit Condition	16 bit, 1 per safety limit, LSB aligned Mandatory if protection limits supported
0x6nn0		0x19	UINT	C		ro	tx				Digital Inputs	Bit 0 = Use set Direct Digital Input Value per mapping
//0x7nnx		Output Data of the Modules										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
0x7nn0	**RECORD**										**Outputs (float)**	
0x7nn0		0x01	BOOL	M		rw	rx				Control State	Desired Control State FALSE: Off TRUE: Running 0: OFF 1: Running
0x7nn0		0x02	BOOL	M		rw	rx				Control Mode	Desired Control Mode 0:Auto 1:Manual 0: Auto 1: Manual

0x7nn0		0x03	pad_12								Reserved	
0x7nn0		0x04…0x0E									Reserved	
0x7nn0		0x0F	BIT2			rw	rx				Output Cycle Counter	Mandatory if DC supported Incremented by the master with each cycle. The slave can determin if the master sends process data bevor the SyncSignal occors
		0x10									Reserved	
0x7nn0		0x11	REAL	M		rw	rx				Target Set Point	Set point set by the user's system
0x7nn0		0x12	REAL	M		rw	rx				Forced MV	User set output percent power in manual Mode +-100.0
0x7nn0		0x13	UINT	C		rw	rx				Clear Alarms	Mask to clear 1 to 16 latched alarms. LSBit=Alarm1 MSBit=Alarm16 Mandatory if device supports any alarm
0x7nn0		0x14	UINT	C		rw	rx				Digital Outputs	Bit 0 = Use set Direct Digital Output Value per mapping Set to 0 during Safe State = Off operating modes

//0x8nnx		Configuration Data of the Modules										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
0x8nn0	**RECORD**										**Sensor Settings (float)**	
0x8nn0		0x01	pad_16								Reserved	
		0x02…0x10									Reserved	
0x8nn0		0x11	USINT	C	B	rw					Sensor Type	Type of sensor being measured 0:TC 1: RTD100 2: RTD1000 3: 4-20mA 4: 0-20mA 5: 0-10V 6-31 Reserved Mandatory if configurable inputs supported
0x8nn0		0x12	USINT	C	B	rw					TC Type	Thermocouple Type 0: K 1: J 2: T 3: E 4: N 5: R 6: S 7: B 8: C 9: D 10: F 11-31 reserved Mandatory if configurable inputs supported
0x8nn0		0x13	USINT	C	B	rw					Units of Measure	Sets the units of measure for the PV value 0: degree Celcius 1: Farenheit 2: Process Mandatory if configurable inputs supported
0x8nn0		0x14	USINT	C	B	rw					Alarm 1 Enable	Enables alarm 1 0: off 1: enabled Mandatory primary alarm supported
0x8nn0		0x15	USINT	C	B	rw					Alarm 2 Enable	Enables alarm 2 0: off 1: enabled Mandatory if second alarm supported
		continuing on next page										
//0x8nnx		Configuration Data of the Modules										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description

0x8nn0		0x16	USINT	M	B	rw					Safe State Action	The control behavior in the safe state 0: Actual Control State (0x6nnn SI 0x01) = OFF 1: Actual Control State (0x6nnn SI 0x01) = ON, Actual Control Mode (0x6nnn SI 0x02) = AUTO, Controlling Set Point (0x6nnn SI 0x16) = Target Set Point (0x7nnn SI 0x11) 2: Actual Control State (0x6nnn SI 0x01) = ON, Actual Control Mode (0x6nnn SI 0x02) = AUTO, Controlling Set Point (0x6nnn SI 0x16)= Standby Set Point (0x8nnn SI 0x20) 3: Actual Control State (0x6nnn SI 0x01) = ON, Actual Control Mode (0x6nnn SI 0x02) = MANUAL, Manipulated Value (0x6nnn 0x12) = Forced MV (0x7nnn SI 0x12) 4: Operate as configured
0x8nn0		0x17	INT								Reserved	Reserved
0x8nn0		0x18	REAL	C	B	rw					Process Scale High	Process value corresponding to an Electrical Scale Low signal Mandatory if configurable inputs supported
0x8nn0		0x19	REAL	C	B	rw					Process Scale Low	Process value corresponding to an Electrical Scale High signal Mandatory if configurable inputs supported
0x8nn0		0x1A	REAL	C	B	rw					Output 1 Cycle Time	The output 1 cycling time in seconds Mandatory if configurable primary output supported
0x8nn0		0x1B	REAL	C	B	rw					Output 2 Cycle Time	The output 2 cycling time in seconds Mandatory if cooling outputs supported (direct acting)
0x8nn0		0x1C…0x1F									Reserved	Reserved
		continuing on next page										
//0x8nnx		Configuration Data of the Modules										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
Setpoint Parameterization												
0x8nn0		0x20	REAL	C	B	rw					Standby Set Point	Set point used for standby situations Mandatory if stand-by or idle set point supported
0x8nn0		0x21	REAL	M	B	rw					SP High Limit	Upper bound for the Target and Standby Set Points
0x8nn0		0x22	REAL	M	B	rw					SP Low Limit	The low bound for the Target and Standby Set Points
0x8nn0		0x23	REAL	M	B	rw					PV Bias (offset)	Value which adjusts the absolute value of The PV Value + or -
0x8nn0		0x24	REAL	M	B	rw					MV High Limit	High bound of the Manipulated Value (MV) +-100.0
0x8nn0		0x25	REAL	M	B	rw					MV Low Limit	Low bound of the Manipulated Value(MV) Range: +-100.0
0x8nn0		0x26	REAL	M	B	rw					Propband 1	Proportional Band for the primary loop
0x8nn0		0x27	REAL	M	B	rw					Integral 1	Integral Time (sec) for the primary loop
0x8nn0		0x28	REAL	M	B	rw					Derivative 1	Derivative Time (sec) for the primary loop
0x8nn0		0x29	REAL	C	B	rw					Propband 2	Proportional Band for the secondary loop (cool or cascade) Mandatory if product supports cooling outputs (direct acting)
0x8nn0		0x2A	REAL	C	B	rw					Integral 2	Integral Time (sec) for the secondary loop (cool or cascade) Mandatory if product supports cooling outputs (direct acting)
0x8nn0		0x2B	REAL	C	B	rw					Derivative2	Derivative Time (sec) for the secondary loop (cool or cascade) Mandatory if product supports cooling outputs (direct acting)
0x8nn0		0x2C	REAL	C	B	rw					Alarm 1 SP High	High alarm trip point for the first alarm Mandatory if device supports primary alarm
0x8nn0		0x2D	REAL	C	B	rw					Alarm 1 SP Low	Low alarm trip point for the first alarm Mandatory if device supports primary alarm
0x8nn0		0x2E	REAL	C	B	rw					Alarm 1 SP Limit High	Upper bound of Alarm 1 SP Mandatory if device supports primary alarm
0x8nn0		0x2F	REAL	C	B	rw					Alarm 1 SP Limit Low	Lower bound of Alarm 1 SP Mandatory if device supports primary alarm
0x8nn0		0x30	REAL	C	B	rw					Alarm 2 SP High	High alarm trip point for the second alarm Mandatory if device supports second alarm
0x8nn0		0x31	REAL	C	B	rw					Alarm 2 SP Low	Low alarm trip point for the second alarm Mandatory if device supports second alarm
0x8nn0		0x32	REAL	C	B	rw					Alarm 2 SP Limit High	Upper bound of Alarm 2 SP Mandatory if device supports second alarm

0x8nn0		0x33	REAL	C	B	rw					Alarm 2 SP Limit Low	Lower bound of Alarm 2 SP Mandatory if device supports second alarm
0x8nn0		0x34	REAL	C	B	rw					Over Temp SP	Over Temp Trip Point Mandatory if device supports Over Temp Limit
0x8nn0		0x35	REAL	C	B	rw					Under Temp SP	Under Temp Trip Point Mandatory if device supports Under Temp Limit

//0x9nnx		Information Data of the Modules										

//0xAnnx		Diagnosis Data of the Modules										

//0xFx30…0xFx37 Object Dictionary of the Device												

//0xF380…0xF3FF		Exception Handling										
//Index	ObjectCode	SI	DataType	M/O/C	B/S	Access	rx/tx	Default	Min	Max	Name	Description
0xF380											Active Exception Status	see CDP
0xF381	**ARRAY**	0x01…0xnn	UDINT	M		RO	tx				Active Device Warning Details	Expanded details of the device warning exceptions. Bit 0 – Loop out of range band if a deviation alarm is used Bit 1 – Loop has an loop error Bits 2-7 – Reserved
0xF382											Active manufacturer Warning Details	see CDP
0xF383	**ARRAY**	0x01…0xnn	UDINT	M		RO	tx				Active Device Error Details	Bit 0 – Loop is in a fault state Bit 1 – Loop has a sensor error Bit 2 – Loop has an process alarm Bits 3-7 – Reserved
0xF384											Active Manufacturer Error Details	see CDP
0xF390											Latched Exceptions	see CDP
0xF391	**ARRAY**	0x01…0xnn	UDINT	M		RO	tx				Latched Device Warning Details	Not Supported
0xF392											Latched manuf. Warning Details	see CDP
0xF393	**ARRAY**	0x01…0xnn	UDINT	M		RO	tx				Latched Device Error Details	Bit 0 – Loop has a latched device fault Bit 1 – Loop has a latched sensor error Bit 2 – Loop has a latched alarm Bits 3-7 – Reserved
0xF394											Latched Manuf. Error Details	see CDP
0xF3A1	**ARRAY**	0x01…0xnn	UDINT	M		RW					Device Exception Warning Mask	00000011
0xF3A2											Manuf. Exception Warning Mask	see CDP
0xF3A3	**ARRAY**	0x01…0xnn	UDINT	M		RW					Device Exception Error Mask	00000111
0xF3A4											Manuf. Exception Error Mask	see CDP

//0xF380…0xF3FF		SDP Device Specific Information Data										
//Index	ObjectCode	SI	DataType	M/O/C	NV	Access	rx/tx	Default	Min	Max	Name	Description
0xF930	**RECORD**										**Conditional module features**	
		0x01…0xnn	INTEGER32	M		RO					Conditional module features	Conditional definitions: Bit0: C1 These parameters exist in products with cooling (direct acting) outputs Bit1: C2 These parameters exist in products with current measurement Bit2: C3 These parameters exist in products that include protection limits Bit3: C4 These parameters exist in products with a stand-by or idle set point Bit4: C5 These parameters exist in products with a configurable primary output Bit5: C6 These parameters exist in products with a primary alarm Bit6: C7 These parameters exist in products with a second alarm Bit7: C8 These parameters exist in products with any alarm Bit8: C9 These parameters exist in products with configurable inputs Bit9: C10 These parameters exist in products that automatically tune

//0xF500…0xF5EF		Manufacturer Specific Device Data										
//Index	ObjectCode	SI	DataType	M/O/C	NV	Access	rx/tx	Default	Min	Max	Name	Description
0xF500	**ARRAY**	0x01…0x16	UINT	M		RO					RM Module Hardware ID	Hardware ID of the module
0xF501	**ARRAY**	0x01…0x16	OCTET_STRING	M		RO					RM Module Firmware Revision	Hardware firmware Revision format "00.00.000"
0xF502	**ARRAY**	0x01…0x16	OCTET_STRING	M		RO					RM Module Part Number	Format "RMxx-xxxx-xxxx"
0xF503	**ARRAY**	0x01…0x16	INTEGER32	M		RO					RM Module Parameter Checksum	
0xF504	**ARRAY**	0x01…0x16	INTEGER32	M		RO					RM Module Serial Number	
0xF510	**ARRAY**	0x01…0x16	UINT	M		RO					ST Module Hardware ID	Hardware ID of the module
0xF511	**ARRAY**	0x01…0x16	OCTET_STRING	M		RO					ST Module Firmware Revision	Hardware firmware Revision format "00.00.000"
0xF512	**ARRAY**	0x01…0x16	OCTET_STRING	M		RO					ST Module Part Number	Format "STxx-xxxx-xxxx"

0xF513	**ARRAY**	0x01…0x16	INTEGER32	M		RO					ST Module Parameter Checksum	
0xF514	**ARRAY**	0x01…0x16	INTEGER32	M		RO					ST Module Serial Number	
//0xF630…0xF637		SDP Device Specific Inputs										
//0xF730…0xF737		SDP Device Specific Outputs										
//0xF830…0xF837		SDP Device Specific Configuration Data										
//0xF930…0xF937		SDP Device Specific Information Data										
//0xFA30…0xFA37		SDP Device Specific Diagnosis Data										
//0xFB30…0xFB37		SDP Device Specific Commands										
//Index	ObjectCode	SI	DataType	M/O/C	NV	Access	rx/tx	Default	Min	Max	Name	Description
0xFB30	**RECORD**			**€**							**Initiate Loop Tune**	
		1	OCTET_STRING	C		RW					Command	Start tuning a loop by number 0 = Tune all loops 1-255 = Start the tune on this control loop A string of numbers may be supported to start multiple loops at the same time.
		2	UNSIGNED8	C		R					Status	Status: 0: last command completed, no errors, no reply 1: last command completed, no errors, reply there 2: last command completed, error, no reply 3: last command completed, error, reply there 255: command is executing
		3	OCTET_STRING	C		R					Response	Response: 0: No tune in progress 1: Tune start failed 2: Tune completed successfully 3-255 vendor specific tune status
0xFB31	**RECORD**			**€**							**Cancel Tune**	
		1	OCTET_STRING	C		RW					Command	Cancel tuning a loop by number 0 = Cancel all loops 1-255 = Cancel the tune on this control loop A string of numbers may be supported to cancel multiple loops at the same time.
		2	UNSIGNED8	C		R					Status	Status: 0: last command completed, no errors, no reply 1: last command completed, no errors, reply there 2: last command completed, error, no reply 3: last command completed, error, reply there 255: command is executing
		3	OCTET_STRING	C		R					Response	Response: 0: No tune in progress 1: Tune cancel failed 2: Cancel completed successfully 3-255 vendor specific tune status