DTS SNMP Map
Version 1.1

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1 SCOPE

1.1 IDENTIFICATION

This is a universal document that describes the SNMP communications Object Identifier (OID) map specification for the Measurlogic family of AC and DC energy sub-meters and transducers. Features are model dependent.

This document applies to models **DTS 305**, **DTS 310**, **DTS SMX**, and **DTS DC**.

1.2 INTRODUCTION

The DTS family of meters is a range of compact DIN-rail, panel, weatherproof or socket mounted energy meters and transducers, with communications and I/O capability. Models are available for single-phase, 3-Phase 2 or 4-Quadrant, and DC measurement applications. Some models are available with optional backlit LCD display.

The remote communications is provided through:

- An Ethernet port using the **SNMP Version 1** protocol.
- The IP address of each device must be unique as per normal TCP networking requirements.
- **This implementation uses the default TCP port 161 for SNMP (Poll/Walks)**.

The following SNMP Management Information Base (MIB) files are available:

- **DTS_SNMP_AC_V110.mib** for the DTS range of AC meters.
- **DTS_SNMP_DC_V110.mib** for the DTS range of DC meters.

NOTE

Capabilities are model dependant, so some registers may not be applicable to certain models.

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2 SNMP INTERFACE SPECIFICATION

2.1 GENERAL INFORMATION

2.1.1 SNMP Object Variables

The measured values of the AC and DC energy sub-meters and transducers are available as SNMP INTEGER variables. The Enterprise ID for DTS meters is 6347. The first OID has the form "1.3.6.1.4.1.6347.1.1.0".

Because all the OIDs have the same prefix, abbreviated OIDs in the form "...1.1.0" are presented in the tables below.

The DTS variables are grouped as follows:

- 1.3.6.1.4.1.6347.1.1.x Instantaneous
- 1.3.6.1.4.1.6347.1.2.x Minimum
- 1.3.6.1.4.1.6347.1.3.x Maximum
- 1.3.6.1.4.1.6347.1.4.x EnergyCounter
- 1.3.6.1.4.1.6347.1.5.x DTS_Identification
- 1.3.6.1.4.1.6347.1.6.x Configuration
- 1.3.6.1.4.1.6347.1.7.x InputOutput

All the SNMP variables in the DTS are **signed 32-bit INTEGER values**.

The SNMP implementation in the DTS family supports the following operations:

- SNMP Get Request
- SNMP GetNext Request
- SNMP Walk
- SNMP Set Request

In order to provide a compact table, Instantaneous, Minimum and Maximum variables are shown in different columns. The Name of the Instantaneous value is shown in the table. To determine the Name of the Minimum or Maximum variable simply append "_Min" or "_Max" respectively.

2.1.2 Measurement Variable Subsets

Depending on the meter model, and also on the way in which the meter is connected and configured, not all of the available channels may be used, and thus not all of the measurement registers described in this document will be applicable. If only one or two channels are connected, then only registers applicable to those channels will contain measurement information. In addition, registers that contain processed information, such as Total or Average, will also contain valid information.

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2.1.3 Power and Energy Register Resolutions and Roll Over

In order to handle the very wide range of possible Power and Energy values due to the flexibility of the DTS Family, it is necessary to vary the SNMP register resolution according to the total power levels being measured. The SNMP register resolutions for the power and the energy registers are the same, therefore a finer resolution provides more significant digits of measured power values, but decreases the total energy accumulation time before the energy registers overflow, and visa versa. The following table shows the ***suggested*** resolutions for various Total Power ranges. These provide 4 or 5 significant digits of power, while still allowing energy to accumulate for over a year before the register overflows:

Total Power			Register Resolution	EnerPowDivider	Energy Roll Over
		< 10 kW	0.1 W	100	99,999.9999 kWh
>= 10 kW	and	< 100 kW	1 W	1,000	999,999.999 kWh
>= 100 kW	and	< 1 MW	10 W	10,000	9,999,999.99 kWh
>= 1 MW	and	< 10 MW	100 W	100,000	99,999,999.9 kWh
>= 10 MW	and	< 100 MW	1 kW	1,000,000	999,999,999 kWh
>= 100 MW	and	< 1 GW	10 kW	10,000,000	9,999,999,990 kWh
>= 1 GW	and	< 10 GW	100 kW	100,000,000	99,999,999,900 kWh

The internal 32-bit energy registers always contain nine significant digits, so will accumulate up to 999,999,999 and then rollover to zero. The rollover point for different energy resolutions is also shown in the table above. ***For example:***

Example Service	Total Power	Register Resolution	EnerPowDivider	Energy Roll Over
Single Phase 3-Wire 120V/240V 200A	48 kW	1 W	1,000	999,999.999 kWh
3-Phase 3/4-Wire 120V/208V 600A	216 kW	10 W	10,000	9,999,999.99 kWh
3-Phase 3-Wire 277V/480V 3000A	2.5 MW	100 W	100,000	99,999,999.9 kWh

An internal divider, called "EnerPowDivider", is used to scale the register resolution of the Power and Energy registers values. The default value of the "EnerPowDivider" in the DTS is 100, which represents a resolution of 0.1W. The value of "EnerPowDivider" can be obtained from variable 1.3.6.1.4.1.6347.1.6.22.

When using DTS Config to configure the attached DTS, the "EnerPowDivider", and hence the resolution scaling, is automatically configured according to the ranges in the above table. When manually configuring the DTS by setting the service voltage and current directly from the host application, it will also be necessary to manually setup "EnerPowDivider" according to the ranges in the above table.

In order to obtain the engineering value of a power or energy, the values read from the power or energy registers must be scaled using a simple formula based on the value in the "EnerPowDivider".

EngineeringValue = RegisterValue * EnerPowDivider * 0.001 (W)

This equation produces engineering values in Watts. If kWatts are required, simply divide again by 1000.

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2.2 AC MEASUREMENT REGISTERS

2.2.1 Measurement Values

Description		Units	Resolution	Object Identifier (1.3.6.1.4.1.6347...) Instantaneous	Minimum	Maximum
Voltage_LN_1		V	0.1	...1.1.0	...1.2.0	...1.3.0
Voltage_LN_2		V	0.1	...1.1.1	...1.2.1	...1.3.1
Voltage_LN_3		V	0.1	...1.1.2	...1.2.2	...1.3.2
Voltage_LN_Average		V	0.1	...1.1.3	...1.2.3	...1.3.3
Voltage_LL_12		V	0.1	...1.1.4	...1.2.4	...1.3.4
Voltage_LL_23		V	0.1	...1.1.5	...1.2.5	...1.3.5
Voltage_LL_31		V	0.1	...1.1.6	...1.2.6	...1.3.6
Voltage_LL_Average		V	0.1	...1.1.7	...1.2.7	...1.3.7
Current_1		A	0.001	...1.1.12	...1.2.12	...1.3.12
Current_2		A	0.001	...1.1.13	...1.2.13	...1.3.13
Current_3		A	0.001	...1.1.14	...1.2.14	...1.3.14
Current_Average		A	0.001	...1.1.15	...1.2.15	...1.3.15
Current_Total		A	0.001	...1.1.16	...1.2.16	...1.3.16
Current_Neutral		A	0.001	...1.1.17	...1.2.17	...1.3.17
Frequency_1		Hz	0.01	...1.1.20	...1.2.20	...1.3.20
Frequency_2		Hz	0.01	...1.1.21	...1.2.21	...1.3.21
Frequency_3		Hz	0.01	...1.1.22	...1.2.22	...1.3.22
Frequency_Average		Hz	0.01	...1.1.23	...1.2.23	...1.3.23
PowerP_1	(Active)	W	See pg 4	...1.1.24	...1.2.24	...1.3.24
PowerP_2		W	See pg 4	...1.1.25	...1.2.25	...1.3.25
PowerP_3		W	See pg 4	...1.1.26	...1.2.26	...1.3.26
PowerP_Total		W	See pg 4	...1.1.27	...1.2.27	...1.3.27
PowerS_1	(Apparent)	VA	See pg 4	...1.1.28	...1.2.28	...1.3.28
PowerS_2		VA	See pg 4	...1.1.29	...1.2.29	...1.3.29
PowerS_3		VA	See pg 4	...1.1.30	...1.2.30	...1.3.30
PowerS_Total		VA	See pg 4	...1.1.31	...1.2.31	...1.3.31
PowerQ_1	(Reactive)	VAR	See pg 4	...1.1.32	...1.2.32	...1.3.32
PowerQ_2		VAR	See pg 4	...1.1.33	...1.2.33	...1.3.33
PowerQ_3		VAR	See pg 4	...1.1.34	...1.2.34	...1.3.34
PowerQ_Total		VAR	See pg 4	...1.1.35	...1.2.35	...1.3.35
DemandP_Total	(Active)	W	See pg 4	...1.1.128	...1.2.128	...1.3.128
PowerFactor_DTS_1		Special	1/32767	...1.1.50	...1.2.50	...1.3.50
PowerFactor_DTS_2		Special	1/32767	...1.1.51	...1.2.51	...1.3.51
PowerFactor_DTS_3		Special	1/32767	...1.1.52	...1.2.52	...1.3.52
PowerFactor_DTS_Overall		Special	1/32767	...1.1.53	...1.2.53	...1.3.53

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2.2.2 Measurement Values (Continued)

Description	Units	Resolution	Object Identifier (1.3.6.1.4.1.6347…) Instantaneous	Minimum	Maximum
ACosPF_1	deg	0.1	…1.1.62	…1.2.62	…1.3.62
ACosPF_2	deg	0.1	…1.1.63	…1.2.63	…1.3.63
ACosPF_3	deg	0.1	…1.1.64	…1.2.64	…1.3.64
ACosPF_Overall	deg	0.1	…1.1.65	…1.2.65	…1.3.65
Voltage_Unbalance_LN_1	%	0.01	…1.1.70	…1.2.70	…1.3.70
Voltage_Unbalance_LN_2	%	0.01	…1.1.71	…1.2.71	…1.3.71
Voltage_Unbalance_LN_3	%	0.01	…1.1.72	…1.2.72	…1.3.72
Voltage_Unbalance_LN_Worst	%	0.01	…1.1.73	…1.2.73	…1.3.73
Voltage_Unbalance_LL_12	%	0.01	…1.1.74	…1.2.74	…1.3.74
Voltage_Unbalance_LL_23	%	0.01	…1.1.75	…1.2.75	…1.3.75
Voltage_Unbalance_LL_31	%	0.01	…1.1.76	…1.2.76	…1.3.76
Voltage_Unbalance_LL_Worst	%	0.01	…1.1.77	…1.2.77	…1.3.77
Current_Unbalance_1	%	0.01	…1.1.78	…1.2.78	…1.3.78
Current_Unbalance_2	%	0.01	…1.1.79	…1.2.79	…1.3.79
Current_Unbalance_3	%	0.01	…1.1.80	…1.2.80	…1.3.80
Current_Unbalance_Worst	%	0.01	…1.1.81	…1.2.81	…1.3.81
Current_SingleCycle_1	A	0.001	…1.1.112	…1.2.112	…1.3.112
Current_SingleCycle_2	A	0.001	…1.1.113	…1.2.113	…1.3.113
Current_SingleCycle_3	A	0.001	…1.1.114	…1.2.114	…1.3.114
Current_SingleCycle_Average	A	0.001	…1.1.115	…1.2.115	…1.3.115
Current_SingleCycle_Total	A	0.001	…1.1.116	…1.2.116	…1.3.116

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2.2.3 Measurement Nett EnergyCounter Values

These counters contain the **nett** energy values. By convention, imported/consumed energies are positive, and exported/generated energies are negative. Therefore, the values in these counters may be positive or negative.

Description		Units	Resolution	Object Identifier (1.3.6.1.4.1.6347…) Instantaneous
EnergyP_1	(Active)	Wh	See pg 4	…1.4.0
EnergyP_2		Wh	See pg 4	…1.4.1
EnergyP_3		Wh	See pg 4	…1.4.2
EnergyP_Total		Wh	See pg 4	…1.4.3
EnergyS_1	(Apparent)	VAh	See pg 4	…1.4.4
EnergyS_2		VAh	See pg 4	…1.4.5
EnergyS_3		VAh	See pg 4	…1.4.6
EnergyS_Total		VAh	See pg 4	…1.4.7
EnergyQ_1	(Reactive)	VARh	See pg 4	…1.4.8
EnergyQ_2		VARh	See pg 4	…1.4.9
EnergyQ_3		VARh	See pg 4	…1.4.10
EnergyQ_Total		VARh	See pg 4	…1.4.11

2.2.4 Measurement Split EnergyCounter Values (Advanced use only)

These counters contain the energies that have been accumulated in each operational area, and are therefore always positive values. There are import/consumed and exported/generated counters for both the active and reactive hemispheres. Similarly, each of the four quadrants each have active and reactive counters.

Description	Units	Resolution	Object Identifier (1.3.6.1.4.1.6347…) Instantaneous
EnergyP_Total_Imp	Wh	See pg 4	…1.4.12
EnergyP_Total_Exp	Wh	See pg 4	…1.4.13
EnergyQ_Total_Imp	VARh	See pg 4	…1.4.14
EnergyQ_Total_Exp	VARh	See pg 4	…1.4.15
EnergyP_Total_Q1	Wh	See pg 4	…1.4.16
EnergyQ_Total_Q1	VARh	See pg 4	…1.4.17
EnergyP_Total_Q2	Wh	See pg 4	…1.4.18
EnergyQ_Total_Q2	VARh	See pg 4	…1.4.19
EnergyP_Total_Q3	Wh	See pg 4	…1.4.20
EnergyQ_Total_Q3	VARh	See pg 4	…1.4.21
EnergyP_Total_Q4	Wh	See pg 4	…1.4.22
EnergyQ_Total_Q4	VARh	See pg 4	…1.4.23

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2.3 DC MEASUREMENT REGISTERS

2.3.1 Measurement & EnergyCounter Values

Description		Units	Resolution	Object Identifier (1.3.6.1.4.1.6347…) Instantaneous	Minimum	Maximum
Voltage_DC		V	0.1	…1.1.0	…1.2.0	…1.3.0
Current_DC		A	0.001	…1.1.12	…1.2.12	…1.3.12
Power_DC		W	See pg 4	…1.1.24	…1.2.24	…1.3.24
Demand_DC		W	See pg 4	…1.1.128	…1.2.128	…1.3.128
Energy_DC	(Nett)	Wh	See pg 4	…1.4.0		
Energy_DC_Imp	(Consumed)	Wh	See pg 4	…1.4.12		
Energy_DC_Exp	(Generated)	Wh	See pg 4	…1.4.13		

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2.4 OTHER REGISTERS

2.4.1 Special Variables

Description	Units	Resolution	Object Identifier (1.3.6.1.4.1.6347…) Instantaneous
DTS_SerialNumber		1	…1.5.1
DTS_FW_Version		0.0001	…1.5.4
DTS_Model_ID		1	…1.5.7
VoltagePrimary	V	0.1	…1.6.0
VoltageSecondary	V	0.1	…1.6.1
CurrentPrimary	A	0.001	…1.6.4
CurrentSecondary	A	0.001	…1.6.5
EnerPowDivider		1	…1.6.22

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2.4.2 Input & Output Status

Description		Object Identifier (1.3.6.1.4.1.6347…) IOD	Analog Value	Digital Value
IO_Channel_1	(AO/DO/DI)	…1.7.0	See Below	0 or 1
IO_Channel_2	(AO/DO/DI)	…1.7.1	See Below	0 or 1
IO_Channel_3	(AO/DO/DI)	…1.7.2	See Below	0 or 1
IO_Channel_4	(AO/DO/DI)	…1.7.3	See Below	0 or 1
IO_Channel_5	(AO/DO/DI)	…1.7.4	See Below	0 or 1
IO_Channel_6	(AO/DO/DI)	…1.7.5	See Below	0 or 1
IO_Channel_A	(DO/DI)	…1.7.8	See Below	0 or 1
IO_Channel_B	(DO/DI)	…1.7.9	See Below	0 or 1
IO_Channel_C	(DO/DI)	…1.7.10	See Below	0 or 1
IO_Channel_D	(DO/DI)	…1.7.11	See Below	0 or 1
InputStatus_A	(DI)	…1.7.12	See Below	0 or 1
InputStatus_B	(DI)	…1.7.13	See Below	0 or 1
InputStatus_C	(DI)	…1.7.14	See Below	0 or 1
InputStatus_D	(DI)	…1.7.15	See Below	0 or 1
IO_Channel_11	(DO)	…1.7.16	See Below	0 or 1
IO_Channel_12	(DO)	…1.7.17	See Below	0 or 1
IO_Channel_13	(DO)	…1.7.18	See Below	0 or 1
IO_Channel_14	(DO)	…1.7.19	See Below	0 or 1
IO_Channel_15	(DO)	…1.7.20	See Below	0 or 1
IO_Channel_16	(DO)	…1.7.21	See Below	0 or 1
IO_Channel_17	(DO)	…1.7.22	See Below	0 or 1
IO_Channel_18	(DO)	…1.7.23	See Below	0 or 1

The value of the Registers and Coils depends on the type of I/O fitted:

AO (Analog Output): The Register value represents the value of the analog output normalized to the rated output, and where 1,000,000 represents 1.0x.

DO (Digital Output) & DI (Digital Input): The Register value is either the debounced status of the line, or the numbers of unprocessed pulses, depending on whether the Digital I/O is being used for status or counting respectively, as configured using DTSConfig.

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2.4.3 General Input Counters

Description	Units	Resolution	Object Identifier (1.3.6.1.4.1.6347…) Instantaneous
GeneralCounter1		1	…1.4.40
GeneralCounter2		1	…1.4.41
GeneralCounter3		1	…1.4.42
GeneralCounter4		1	…1.4.43

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2.4.4 Input and Output Capabilities

The possible number and type of inputs and outputs will vary depending on the DTS model. Furthermore, the exact number and type of inputs and outputs actually fitted to any particular meter is determined by the options specified at the time of ordering.

Channel	DTS-305	DTS-310	DTS-SMX	DTS-SKT	DTS-DC	DTS-101/5
IO_Channel_1	AO/DO	DO/DI	DO/DI	DO	DO/DI	AO
IO_Channel_2	AO/DO	DO/DI	DO/Di		DO/DI	AO
IO_Channel_3	AO/DO	DO	DO		DO	DO
IO_Channel_4	AO/DO					
IO_Channel_5	AO/DO					
IO_Channel_6	AO/DO					
IO_Channel_A	DO					
IO_Channel_B	DO					
IO_Channel_C	DO					
IO_Channel_D/Pulse	DO					
InputStatus_A	DI					
InputStatus_B	DI					
InputStatus_C	DI					
InputStatus_D	DI					
IO_Channel_11			DO			
IO_Channel_12			DO			
IO_Channel_13			DO			
IO_Channel_14			DO			
IO_Channel_15			DO			
IO_Channel_16			DO			
IO_Channel_17			DO			
IO_Channel_18			DO			

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