



# 16

## CHAPTER

# INDUSTRY CANADA SUPPLEMENTARY REQUIREMENTS FOR APPROVAL OF TYPE

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### 16.1 Access Permission, Metrological Quantities and Seal

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Table driven meters are expected to be programmable to some extent. Programming of electronic meters is normally accomplished through write actions to tables. Programming and modifications to end device data can be divided into two categories

- changes to metrological quantities;
- changes to non-metrological quantities.

Industry Canada provides the following definitions for end devices programmability and metrological quantities:

**Metrological Parameter:** any constant, factor or algorithm used by metering device to produce results that can be the basis of billing.

**Metering Device Reprogramming:** altering any metrological parameter.

End device configuration<sup>1</sup> and initial verification take place before the installation of a physical seal. However, unlike electromechanical meters, a seal does not necessarily disallow changes to metrological quantities. End device configuration is not permitted while the seal is installed. However, end device programming is permitted by Industry Canada, under seal, subject to the availability of an audit control system (the event logger), which records all permissible changes to metrological quantities.

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<sup>1</sup> The distinction between end device configuration and programming is an important one. End device configuration shall be performed with the physical seal removed, and in fact may be a proprietary process.

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Industry Canada requires that ANSI C12.19-1997 compliant end devices shall be equipped with event loggers, if their metrological quantities are programmable. However, recognizing that having an event logger may impose an unacceptable burden on some end devices, Industry Canada provides a mechanism for the transfer of event log records to the utility and it has clearly identified those utility tables which must be event logged.

## **16.2 Electronic Meters Without An Event Logger Inside The Meter**

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End devices that are not equipped with an event logger are not permitted to alter metrological parameters while they are under a physical seal.



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## 16.3 W/WO Event Logger Inside The Meter

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The activation or deactivation a feature using any other means may be subject to mechanically removing a physical seal.

## 16.4 Electronic Meters with An Event Logger Inside The Meter

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End devices that are equipped with an event logger are be permitted to change certain tables through a communication channel while the physical seal is in place. These changes are permitted only if the end device has room for the creation of an event log entry, following the acceptance of the changes without a fault.

### 16.4.1 Meter Embedded Event Logger Functional Characteristics

In this Specification event log entries can only be created as a result of changes to metrological parameters. Changes to metrological parameters shall be reflected as changes in corresponding tables. It is not permitted to use the event logger as a general purpose information logging mechanism. Industry Canada compliant devices shall only log changes to tables, which have been identified by Industry Canada to contain metrological quantities.

When an event log entry is created it must contain the following information:

- time and date stamp,
- user ID,
- event descriptor,
- event sequence number,
- data affected [old values]

The utility may set the event time manually, by entering the time of day, on end devices that are not equipped with a real-time-clock.

While the event log list is full, the end device shall not permit any changes to take place on tables or quantities, which are event logable. The only exception to this rule is the execution of the event log “update list pointers” procedure. [This shall release space for new event logger records and shall subsequently create an event log record for this action only after the successful transfer of the event log entries from the end device into the utility’s permanent data base.]

The size of the event log table shall be sufficiently large to hold at any time one entry. This entry shall be reserved for to record the execution of the “update list pointers” procedure. The result of the execution of the “update list pointers” procedure is the release of space for new event log records. The Industry Canada proposed amendments to the approval of type for Electronic Metering Devices (1995) suggests that there may be a minimum imposed size of the event log. This minimum has been set to 30 events..



The “update list pointer” procedure shall not cause existing event log entries to be erased. Reading the event log table (Table 76) following the execution of the update list pointers procedures shall not fail to deliver the old records in the event log tables.

When event log entries are created it is permissible to over-write existing (old) event log records that have been transferred to the Utility permanent data base and have been released using the “update list pointers” procedure.

Event log records shall be created upon the action of writing to pending tables or activation of pending tables that need to be recorded into the event log.

### 16.4.2 Access Security

All communication programmable end devices shall have provisions for access protections to key tables. Access permissions shall be consistent with the concepts described in decade 2, Security Tables. Certain tables should be marked as read only (See “Table 00 - General Configuration” on page 4-2), or write enabled subject to the presence of the event logger (Chart 16.11, “Procedure Identifiers (Includes Industry Canada Supplementary Permissions)”).

### 16.4.3 Access to Metrological Tables and Event Logging Maps

Chart 16.1

Symbols used is access control and logging requirements below

Column	Heading Description	?	✗	✓	blank
W	Table is be writable without an event logger	???	No	Yes	Not required
E	Table is event logable if table is writable	???	No W	Yes	No, See W
M	Table is metrological	???	No	Yes	Don't know



Chart 16.2

Measurement Canada Supplementary Access Permissions for [Decade 0 - End Device Configuration Identification and Procedure Tables](#)

If An Event Logger Is Available Then Write Access Is Allowed An Event Log Entry Shall Be Created			
Write Access Allowed			
Table ID	W	E	M
<a href="#">Table 00 - General Configuration</a>	X	✓	✓
<a href="#">Table 01 - General Manufacturer Identification</a>	X		
<a href="#">Table 02 - Device Nameplate</a>	X	✓	
<a href="#">Table 03 - ED_MODE Status</a>	X		
<a href="#">Table 04 - Pending Status</a>	X		
<a href="#">Table 05 - Device Identification</a>	X	✓	✓
<a href="#">Table 06 - Utility Information</a>	✓		
<a href="#">Table 07 - Procedure Initiate<sup>a</sup></a>	✓	✓	✓
<a href="#">Table 08 - Procedure Response</a>	X		

a. See [Table 16.11, "Procedure Identifiers \(Includes Industry Canada Supplementary Permissions\)"](#), on page 9, for further qualifiers.

Chart 16.3

Measurement Canada Supplementary Access Permissions for [Decade 1 - Data Source Tables](#)

If An Event Logger Is Available Then Write Access Is Allowed An Event Log Entry Shall Be Created			
Write Access Allowed			
Table ID <sup>a</sup>	W	E	M
<a href="#">Table 10 - Dimension Sources Limiting</a>	X		✓
<a href="#">Table 11 - Actual Sources Limiting</a>	X		✓
<a href="#">Table 12 - Unit Of Measure</a>	X		✓
<a href="#">Table 13 - Demand Control</a>	X	✓	✓
<a href="#">Table 14 - Data Control</a>	X		✓
<a href="#">Table 15 - Constants</a>	X	✓	✓
<a href="#">Table 16 - Source Definition</a>	X		✓

a. All sources defined in [Decade 1 - Data Source Tables](#), shall be verified by Measurement Canada before physically sealing the end device, and can be made available for selection and use while the end device is under physical seal.



Chart 16.4

Measurement Canada Supplementary Access Permissions for [Decade 2 - Register Tables](#)

If An Event Logger Is Available Then Write Access Is Permitter And An Event Log Entry Must Be Created			
Write Access Allowed With or Without an Event Logger			
Table ID	W	E	M
Table 20 - Dimension Register Limiting <sup>a</sup>	X	✓	✓
Table 21 - Actual Register	X	✓	✓
Table 22 - Data Selection <sup>a</sup>	X	✓	✓
Table 23 - Current Register Data	X		✓
Table 24 - Previous Season Data	X		✓
Table 25 - Previous Demand Reset Data	X		✓
Table 26 - Self Read Data	X		✓
Table 27 - Present Register Selection <sup>a</sup>	✓		
Table 28 - Present Register Data	X		✓

- a. Although changes are permitted to this table. The changes should not result in the introduction of uncertainties into the current, and previous data registers. Also registers shall not lose their values or introduce values that are not derived from a valid measurement.

Chart 16.5

Measurement Canada Supplementary Access Permissions for [Decade 3 - Local Display Tables](#)

If An Event Logger Is Available Then Write Access Is Permitter And An Event Log Entry Must Be Created			
Write Access Allowed With or Without an Event Logger			
Table ID	W	E	M
Table 30 - Dimension Display Limiting	X		✓
Table 31 - Actual Display	X		✓
Table 32 - Display Source <sup>a</sup>	X	✓	✓
Table 33 - Primary Display List	X	✓	✓
Table 34 - Secondary Display List	✓		

- a. Modifications are limited on formatting fields only not selections.



Chart 16.6

Measurement Canada Supplementary Access Permissions for [Decade 4 - Security Tables](#)

If An Event Logger Is Available Then Write Access Is Permitter And An Event Log Entry Must Be Created			
Write Access Allowed With or Without an Event Logger			
Table ID	W	E	M
<a href="#">Table 40 - Dimension Security Limiting</a>	✓		
<a href="#">Table 41 - Actual Security Limiting</a>	✓		
<a href="#">Table 42 - Security</a>	✓		
<a href="#">Table 43 - Default Access Control</a>	✓		
<a href="#">Table 44 - Access Control</a>	✓		
<a href="#">Table 45 - Key</a>	✓		

Chart 16.7

Measurement Canada Supplementary Access Permissions for [Decade 5 - Time and Time of Use Tables](#)

If An Event Logger Is Available Then Write Access Is Permitter And An Event Log Entry Must Be Created			
Write Access Allowed With or Without an Event Logger			
Table ID	W	E	M
<a href="#">Table 50 - Dimension Limiting Time and Time of Use</a>	✓	✓	✓
<a href="#">Table 51 - Actual Time And TOU Limiting</a>	✓	✓	✓
<a href="#">Table 52 - Clock<sup>a</sup></a>	X		✓
<a href="#">Table 53 - Time Offset</a>	✓	✓	✓
<a href="#">Table 54 - Calendar</a>	✓	✓	✓
<a href="#">Table 55 - Clock State</a>	X		✓
<a href="#">Table 56 - Time Remaining</a>	X		✓

a. The clock is set via the “Set Date and/or Time” procedure



Chart 16.8

Measurement Canada Supplementary Access Permissions for [Decade 6 - Load Profile Tables](#)

If An Event Logger Is Available Then Write Access Is Permitter And An Event Log Entry Must Be Created					
Write Access Allowed With or Without an Event Logger			Billing		
Table ID	W	E	W	E	M
<a href="#">Table 60 - Dimension Limiting Load Profile</a>	✓		X	✓	✓
<a href="#">Table 61 - Actual Load Profile Limiting</a>	✓		X	✓	✓
<a href="#">Table 62 - Load Profile Control</a>	✓		X	✓	✓
<a href="#">Table 63 - Load Profile Status</a>	X		X		✓
<a href="#">Tables 64..67 - Load Profile Data Sets 1..4</a>	X		X		✓

Chart 16.9

Measurement Canada Supplementary Access Permissions for [Decade 7 - History and Event Logs](#)

If An Event Logger Is Available Then Write Access Is Permitter And An Event Log Entry Must Be Created			
Write Access Allowed With or Without an Event Logger			
Table ID	W	E	M
<a href="#">Table 70 - Limiting Log Dimensions</a>	X		
<a href="#">Table 71 - Actual Log Dimensions<sup>a</sup></a>	✓		
<a href="#">Table 72 - Event Identification</a>	X		
<a href="#">Table 73 - History Log Control</a>	✓		
<a href="#">Table 74 - History Log Data</a>	X		
<a href="#">Table 75 - Event Log Control<sup>b</sup></a>	X		✓
<a href="#">Table 76 - Event Log Data</a>	X		✓

- Write operations to fields that modify event-logger tables' fields (Tables 72, 75 and 76) shall not take effect.
- Only the event that are required by Measurement Canada for use in the Event Logger shall be selected.



**Chart 16.10** Measurement Canada Supplementary Access Permissions for [Decade 8 - User Defined Tables](#)

If An Event Logger Is Available Then Write Access Is Permitter And An Event Log Entry Must Be Created			
Write Access Allowed With or Without an Event Logger			
Table ID	W	E	M
<a href="#">Table 80 - Dimension Function Limiting</a>	✓		
<a href="#">Table 81 - Actual Function Limiting</a>	✓		
<a href="#">Table 82 - List</a>	✓		
<a href="#">Table 83 - Selection</a>	✓		
<a href="#">Table 84 - First User Defined to Table 89 - Sixth User Defined<sup>a</sup></a>	✓	✓	✓

a. The write, event and metrological characteristics of these table and contained fields shall compliant with the associated tables and fields conveyed within.

**Chart 16.11** Procedure Identifiers (Includes Industry Canada Supplementary Permissions)

If An Event Logger Is Available Then An Event Log Entry Must Be Created				If An Event Logger Is Available Then An Event Log Entry Must Be Created			
Allowed without event logger <sup>a</sup>				Allowed without event logger <sup>a</sup>			
Proc ID	Procedure Action	W	E	Proc ID	Procedure Action	W	E
0	Cold Start (factory setup)	X		10	Set Date and/or Time <sup>b</sup>	✓	✓
1	Warm Start (reboot)	X	✓	11	Execute Diagnostics Procedure <sup>c</sup>	✓	
2	Save Configuration (to nvmem) <sup>d</sup>	X	✓	12	Activate All Pending Tables <sup>e</sup>	✓	✓
3	Clear Data (registers only) <sup>f</sup>	X		13	Activate Specific Pending Tables <sup>e</sup>	✓	✓
4	Reset List Pointers <sup>g</sup>	✓		14	Clear All Pending Tables	✓	
5	Update Last Read Entry <sup>h</sup>	✓	✓	15	Clear Specific Pending Tables	✓	
6	Change End Device Mode	X	✓	16	Start Load Profile (recorder) <sup>i</sup>	✓	✓
7	Clear Standard Status Flags	✓		17	Stop Load Profile (recorder) <sup>j</sup>	✓	✓
8	Clear Manufacturer Status Flags	✓		18	Log In (establish security/session)	✓	
9	Remote Reset (demand, season)	✓		19	Log out	✓	

a. When a procedure is parked with “X”, indicating that its execution is not allowed without an event logger then the procedure may only be executed by breaking the seal.  
 b. An event log entry shall be created when the time correction affects the meter accuracy performance.



- c. This procedure is not allowed to execute if it interferes with metering operations, when the end device is in metering state.
- d. When the “Save Configuration” procedure is used, all writes to tables shall be deferred until the “Save Configuration” procedure is executed. If any of the modified set of tables include a metrological table then event log entry (or entries) shall be generated. If the “Save Configuration” is not executed by the end of a session, all modifications to tables during the session shall be lost.
- e. An event log entry is created only upon activation of tables which might result in changes to metrological quantities.
- f. In Canada it is not permitted to clear data registers or metrological quantities.
- g. In Canada it is not permitted to reset the event logger list pointers.
- h. In Canada an event log entry is created when updating the event logger list pointers.
- i. Event logable if load profiler is used for billing.
- j. Event logable if load profiler is used for billing.