# The Meter Driver

The Meter driver periodically collects cumulative totals from several metering devices, calculates usage over the period, and records these usage figures within a comma-separated value (CSV) file, so that other applications can access the data. Available for ObSys only.

This document relates to Meter driver version 1.0

Please read the *ObSys Manual* alongside this document, available from *www.northbt.com*

# Contents

# Purpose of Meter Driver

The Meter driver periodically collects cumulative totals from several metering devices, calculates usage over the period, and records these usage figures within a comma-separated value (CSV) file, so that other applications can access the data.

By recording usage of a resource, users can determine how and when to make changes to procedures and equipment to save resource use, and therefore save money.

As an example, the Meter driver could produce a report about electricity usage in an area every half-hour. Electricity usage over the time can then be viewed using applications such as Microsoft Excel, energy saving opportunities can be determined, and put into practice, and the results of such changes also recorded.

## Detailed Operation

The Meter driver produces a single report for up to 32 meters. The driver reads a cumulative total value from each meter periodically, and then calculates periodic usage for each meter over the report period.

### CSV File

The full folder and filename of the report can be specified to allow the driver to write to whichever location is necessary.

Each line of the CSV file contains the usage value from every meter, separated by commas. Lines are appended to the file at the end of each period.

If another application has locked the report file, the driver will store information into a temporary file, and append the contents when the application unlocks the report file.

Times within reports are stored in UTC format, allowing simple international operation.

### Virtual Meters

Usually the driver collects data from one or more meters. However, it can also use previously collected data to calculate data for a virtual meter. Possible calculations are:

- Add one meter value to another meter value
- Subtract one meter value from another meter value
- Add a constant to a meter value
- Subtract a constant from a meter value

This allows, say, a constant background value to be subtracted from a meter; to add two sub-meter values together to produce a single overall meter value; it is even possible to transfer a value into the constant field of the calculation if necessary.

### Reports

The report has a maximum file size. When the file grows larger than this, the file is shrunk to 70% of the maximum size (the earlier records are lost). This means that the CSV file will accumulate many days or months of information, but will shrink itself before it consumes the whole of a disk drive.

### Alarms

If necessary, the driver will monitor the periodic usage, and generate an alarm if it exceeds a predefined value. This simplifies monitoring of usage, and the alarm can be delivered by any method supported by the driver host, including email and SMS.

### Scaling Calculations

The usage value for each meter can be rescaled to four different units, for display and logging purposes.

For example, if the actual usage is in kWh, multiplying by approximately 0.1 give a £ cost for electricity, and multiplying kWh by 0.542 produces and approximate 'kg CO2' usage. If necessary, other tasks can modify the multiplication and addition factors, to produce more accurate results.

## Example Report File

The values in the file are comms-separated, with a single line recorded for each report period. A header line simplifies understanding.

```
DateTime,Meter1,Meter2,Meter3,Total
22/05/2013 12:00,2.7,2.1,2.4,7.2
22/05/2013 13:00,2.2,2.1,2.7,7.0
22/05/2013 14:00,2.3,2.5,2.1,6.9
22/05/2013 15:00,2.7,2.1,2.4,7.2
22/05/2013 16:00,2.3,2.2,2.7,7.2
22/05/2013 17:00,2.4,2.3,2.7,7.4
```

# Using the Driver

On ObSys, the Meter driver is pre-installed. Once started, you will need to set up the driver before it can produce meter reports in CSV files.

## Starting the Interface

💻 To start an interface using the Meter driver, follow these steps:

→ **Start Engineering** your North device using ObSys

→ Navigate to **Configuration, Interfaces,** and set an unused **Interface** to 'Meter' to start the particular interface

→ Navigate to the top-level of your North device and re-scan it

The driver setup object (Mc), labelled **Meter Setup**, should now be available. If this object is not available, check an interface licence is available and the driver is installed.

## Setting up the Driver

💻 To set up the driver, follow these steps:

→ Navigate to the **Meter Setup** object (Mc). For example, if you started interface 1 with the driver earlier, then the object reference will be 'M1'

→ Set at least one **Meter** needs to be set up

# Alarms

When a meter's period usage exceeds the pre-defined alarm limit, the Meter driver sends an alarm.

## Format

North-format alarms contain six text fields. The Meter driver places the following information into these fields:

**System** – copied from System Label object (DL) within driver setup

**Point** – copied from Meter label

**Condition** – either 'Usage Alarm' or 'Usage Ok'

**Priority** – '3'

**Date & Time** – from North device

## Examples

| System | Point | Condition | Priority | Date | Time |
|---|---|---|---|---|---|
| Meter Monitor | Floor 5 UPS | Usage Alarm | 3 | 04/01/12 | 14:22:00 |
| Meter Monitor | Floor 5 UPS | Usage Ok | 3 | 04/01/12 | 14:23:00 |

# Object Specifications

Once an interface is started, one or more extra objects become available within the top-level object of the device. As with all North objects, each of these extra objects may contain sub-objects, (and each of these may contain sub-objects, and so on) - the whole object structure being a multi-layer hierarchy. It is possible to navigate around the objects using the ObSys Engineering Software.

Each object is specified below, along with its sub-objects.

## Device Top-Level Objects

When an interface is started using the Meter driver, the objects below become available within the top-level object of the device. For example, if interface 1 is started, then the object reference 'M1' becomes available.

| Description | Reference | Type |
|---|---|---|
| **Meter Setup**<br>Set up the Meter driver, started on interface *c* (*c* is the interface number) | M*c* | Fixed Container:<br>On the ObSys platform this will be<br>*[OSM v20\Meter v10]* |
| **Meter Monitor** | S*c* | Fixed Container:<br>On the ObSys platform this will be<br>*[Meter v10]* |

# Meter Driver Setup

Object Type: *[OSM v20\Meter v10]*

The Meter Driver Setup contains the following objects:

| Description | Reference | Type |
|---|---|---|
| **Device Label** | DL | Obj\Text; Max Length 20; Adjustable |
| **Filename**<br>The full folder and file name of the report CSV file | FN | Obj\File; Adjustable |
| **Max file size (MB)**<br>If the file grows larger than this, it will be shrunk to 70% of this size | FS | Obj\Num; Adjustable |
| **Report Period (mins)**<br>The period is automatically synchronised with the real-time of the North device | P | Obj\Num; High Limit = 40320 (1 day); Adjustable |
| **Meter *m***<br>Meter *m* setup information (*m* is the meter number, in the range 1..32) | M*m* | Fixed Container:<br>*[OSM v20\Meter v10\Meter]* |

# Meter Setup

Object Type: *[OSM v20\Meter v10\Meter]*

A Meter Setup contains the following objects:

| Description | Reference | Type |
|---|---|---|
| **Label**<br>Meter label | L | Obj\Text; Max Length: 20; Adjustable |
| **Units**<br>Units of measurement | U | Obj\Text; Max. 8 chars; Adjustable |
| **Source Function**<br>This determines whether this meter reads from a real meter in the field, or calculates a virtual meter value | T | Obj\ENum; Range 0..4; Adjustable<br>Value: 0=Object, 1=mA+mB, 2=mA-mB, 3=mA+constB, 4=mA-constB |
| **Source Object**<br>Object reference to collect cumulative total | O | Obj\Obj; Adjustable |
| **Source A**<br>If Source function specifies 'mA', then this contains the Meter number m to use | A | Obj\Num; Range 0..32; Adjustable |
| **Source B**<br>If Source function specifies 'constB', then this contains the constant value.<br>If Source function specifies 'mB', then this contains the Meter number m to get the value from | B | Obj\Float; Adjustable |
| **Cumulative Value**<br>If Source function is 'Object', this is the last cumulative value read | LR | Obj\Float |
| **Usage Value**<br>Usage for last period | V | Obj\Float |
| **Usage Alarm Limit** | AL | Obj\Float; Adjustable |
| **Usage Alarm**<br>Indicates the usage value is above the alarm limit | AS | Obj\NoYes |
| **Calculation *c***<br>Calculation *c* setup information, where *c* is the calculation number in the range 1..4 | C*c* | Fixed Container:<br>*[OSM v20\Meter v10\Calc]* |

# Calculation Setup

Object Type: *[OSM v20\Meter v10\Calc]*

A Calculation Setup contains the following objects:

| Description | Reference | Type |
|---|---|---|
| **Units**<br>The units of measurement that the calculation produces from the original value | U | Obj\Text; Max Chars 7; Adjustable |
| **Multiply**<br>Multiplication factor to apply (If set to 0, the value is multiplied by 1) | M | Obj\Float; Adjustable |
| **Add**<br>The value to add to the result, after the multiplication has been applied | A | Obj\Float; Adjustable |

# Meter Monitor

Object Type: *[Meter v10]*

The Meter Monitor contains the following objects:

| Description | Reference | Type |
|---|---|---|
| **Meter *m* Information**<br>The meter number, *m*, is in the range 1..32 | M*m* | Fixed Container:<br>*[Meter v10\MeterInfo]* |

# Meter Information

Object Type: *[Meter v10\MeterInfo]*

A Meter Information object represents the information from an individual meter (either real or calculated), and contains the following objects:

| Description | Reference | Type |
|---|---|---|
| **Label** | L | Obj\Text; Max Length: 20 |
| **Units** | U | Obj\Text; Max. 8 chars |
| **Cumulative Value**<br>This value will be 0 if the Meter value is calculated | LR | Obj\Float |
| **Usage Value**<br>Usage for last period | V | Obj\Float |
| **Usage Alarm Limit** | AL | Obj\Float |
| **Usage Alarm** | AS | Obj\NoYes |
| **Calculation *c* Units**<br>The units that the calculation *c* produces from the original value, where *c* is in the range 1..4 | C*c*.U | Obj\Text; Max Chars 7 |
| **Calculation *c* Value**<br>The result of the calculation *c*, where *c* is in the range 1..4 | C*c*.V | Obj\Float |

# Driver Versions

| Version | Build Date | Details |
|---|---|---|
| 1.0 | 23/05/13 | Driver released |

## Next Steps…

If you require help, contact support on 01273 694422 or visit *www.northbt.com/support*

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