

MC12.18

User's Guide

For

**ANSI Type II Optical Port Communication Protocol
Complement for the Utility Industry End Device Data Tables**

October 29, 2013

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Abstract: The technical content of this User's Guide is nearly identical to IEEE Std 1701™-2011 and ANSI C12.18-2006, using IEEE Std 1701-2011 as the baseline for the MC12.18 User's Guide. The protocol provides multi-source and "plug and play" environment for the millions of metering devices in the field now and the future using the ANSI Type 2 optical port interface. It solves the problems associated with single source systems and with multi-source systems based upon proprietary communications protocols. Electric, Water, and Gas Utilities and corresponding vendors can realize cost savings that ultimately shall benefit the client consumers of the Utilities.

Keywords: IEEE Std 1701, ANSI C12.18, MC12.18, Optical Port, ANSI Type II, PSEM

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Introduction

This introduction is not part of the MC12.18 User's Guide. For consistency with IEEE Std 1701 and ANSI C12.18 the word "standard" was retained throughout this User's Guide in reference to this document. Also in reference to MC12.18, MC12.19, MC12.21 and MC12.22, the term "standard" means "User's Guide".

The ANSI C12.18 and IEEE Std 1701 standard and the MC12.18 User's Guide provide an open-platform communications protocol for two-way communication with an End Device (e.g. a meter) through an ANSI Type 2 Optical Port. The protocol is written to conform to the OSI seven-layer stack. Readers of IEEE Std 1701-2011 or ANSI C12.18-2006 will discover some editorial corrections were applied in this version of the document in order to address deficiencies that were discovered since the publication of ANSI C12.18-2006 and IEEE Std 1701. Each and every correction is identified were applied and were forwarded to the respective working groups IEEE P1701 and ASC 12 SC 17 WG4 for inclusion in future revisions of ANSI C12.18 and IEEE Std 1701.

The 2006 version to the ANSI publication of ANSI C12.18, the 2011 version of the IEEE publication of IEEE Std 1701 and the release of this version of the MC12.18 User's Guide should be considered in the context of the so-called "protocol suite" of standards:

- a. ANSI C12.18 / MC12.18 / IEEE Std 1701™,
- b. ANSI C12.19 / MC12.19 / IEEE Std 1377™,
- c. ANSI C12.21 / MC12.21 / IEEE Std 1702™,
- d. ANSI C12.22 / MC12.22 / IEEE Std 1703™, and
- e. Draft ANSI C12.23 / Draft MC12.23 / IEEE P1705™.

The ANSI and IEEE published changes were included only after assuring that existing devices implementing ANSI C12.18-1996, ANSI C12.18-2006 and IEEE Std 1701-2011 continue to remain compatible with this version of the document.

This document corrects an error in the original ANSI C12.18-1996 standard such as the impossibility of using index-count access methods for table access. It also corrects errors in the description of the parameters of the <identification> service found in ANSI C12.18-2006 and IEEE Std 1701-2011. Other concepts addressed include compliance, backward and forward compatibility, the use of reserved fields, the Identification Service, packet size and the toggle bit. Finally, some alignment with the equivalent functions found in ANSI C12.22-2012 / IEEE Std 1703-2012 / MC12.22-2013 standard was performed to meet the goal of producing a coherent suite of protocol standards.

Also note that document describes an optionally exposed point-to-point interface between a C12.18 Device and a C12.18 Client. The terms "C12.18 XXXX" (e.g., C12.18 Device) were introduced by ANSI C12.18-1999. These terms can be interchangeably replaced with the terms "IEEE 1701 XXXX" or "MC12.18 XXXX"; i.e., the IEEE 1701 Device is the same as the ANSI C12.18 Device and MC12.18 Device. However, since these documents were jointly developed under the auspice of ANSI C12 SC17 WG4, the document terminology is based on C12.18 terms. Therefore references to ANSI or IEEE devices or standards are equivalent to references to the corresponding MC12.xx devices or User's Guides.

Otherwise, this document is identical to the published ANSI C12.18-2006 / IEEE Std 1701-2011 Standards.

Notice to users

The body of this User's Guide was developed jointly with ANSI C12.18 and IEEE Std 1701. The joint agreement calls for the standards and regulatory organizations IEEE, ANSI and MC to maintain the body of this standard in

step as they publish versions and revisions of the standard. A number of editorial corrections were made in the preparation of the MC12.18 User's Guide after the publication of ANSI C12.18-2006 and IEEE Std 1701-2011. These corrections were incorporated into this User's Guide and highlighted in the body of the document to indicate that the text was corrected. The detailed list of corrections is also shown in Annex E - Listing of Editorial Corrections to ANSI C12.18-2006 and IEEE Std 1701.

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Users of this User's Guide should consult all applicable laws and regulations. Conformance with the provisions of this document does not imply compliance or conformance to any applicable regulatory requirements. Implementers of the User's Guide are responsible for observing or referring to the applicable regulatory requirements. Measurement Canada does not, by the publication of its documents, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

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Errata

Errata, if any, for this User's Guide can be accessed at the following URL: <http://www.ecmx.org>. Users are encouraged to check this URL for errata periodically.

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1 Optical Port Communication Protocol to 2 Complement the Utility Industry End 3 Device Data Tables

Protocol Specification for ANSI Type 2 Optical Port

1 Overview

1.1 Scope

The User's Guide details the criteria required for communications with a Utility End Device by another device via an optical port. The other device could be a hand held reader, a laptop or portable computer, a master station system, or some other electronic communications device. It shall provide the optical port lower layers communication protocol for the Utility metering Industry including specifically Water, Gas, and Electric.

The Standard provides details for a complete implementation of an OSI 7-layer model in accordance with ISO/IEC 7498-1. The protocol specified in this document was designed to transport data in Table format. The Table definitions are in ANSI C12.19 (MC1219, IEEE 1377) Utility Industry End Device Data Tables.

1.2 Purpose

The Utility Industry has need for a standard that provides an operable "plug and play" environment for field metering devices. The purpose of this standard is to define the means to transport the Utility Industry End Device Data Tables via an optical port such that multi-source environment and End Device interchangeability is possible.

2 Normative References

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

ANSI C12.18 (2006), *Protocol Specification for ANSI Type 2 Optical Port*

ANSI C12.19 (2012), *Utility Industry End Device Data Tables*

ANSI C12.21 (2006), *Protocol Specification for Telephone Modem Communication*

ANSI C12.22 (2012), *Protocol Specification for Interfacing to Data Communication Networks*

IEEE Std 1701 (2011), *IEEE Standard for Optical Port Communication Protocol to Complement the Utility Industry End Device Data Tables*