



FIELD COMM GROUP™

*Connecting the World of
Process Automation*



COMMUNICATION PROTOCOL

**Universal Command Test
Specification**

**HCF_TEST-003, FCG TT20003
Revision 5.1**

Release Date: 22 September 2021

Release Date: 22 September 2021

Document Distribution / Maintenance Control / Document Approval

To obtain information concerning document distribution control, maintenance control and document approval, please contact the FieldComm Group at the address shown below.

Copyright © 1998, 2001, 2004, 2009, 2017, 2020, 2021 FieldComm Group

This document contains copyrighted material and may not be reproduced in any fashion without the written permission of the FieldComm Group.

Trademark Information

HART[®] and WirelessHART[®] are registered trademarks of the FieldComm Group, Austin, Texas, USA. Any use of the term HART or WirelessHART hereafter in this document, or in any document referenced by this document, implies the registered trademark. All other trademarks used in this or referenced documents are trademarks of their respective companies. For more information contact the FieldComm Group Staff at the address below.



FIELDCOMM GROUP™

*Connecting the World of
Process Automation*

FieldComm Group
9430 Research Boulevard
Suite 1-120
Austin, TX 78759, USA

Voice: +1 512-792-2300
FAX: 1-512-792-2310

<http://www.fieldcommgroup.org>

Use of imperatives in HART Specifications

The key words (imperatives) "must", "required", "shall", "should", "recommended", "may", and "optional" when used in this document are to be interpreted as follows:

- Must** **Must, Shall, or Required** denotes an absolute mandatory requirement. For example, "All HART Field Devices must implement all Universal Commands"
- Should** **Should or Recommended** indicates a requirement that, given good cause/reason, can be ignored. However, the consequences of ignoring the requirement must be fully understood and well justified before doing so.
- May** **May or Optional** identifies a requirement that is completely optional and can be supported at the discretion of the implementation. May can be used to identify optional Host Application or Master functionality and, when this is the case, does not imply the function is optional in Field Devices.

Intellectual Property Rights

The FieldComm Group does not knowingly use or incorporate any information or data into the HART Specifications which the FieldComm Group does not own or have lawful rights to use. Should the FieldComm Group receive any notification regarding the existence of any conflicting Private IPR, the FieldComm Group will review the disclosure and either (a) determine there is no conflict; (b) resolve the conflict with the IPR owner; or (c) modify this specification to remove the conflicting requirement. In no case does the FieldComm Group encourage implementers to infringe on any individual's or organization's IPR.

Table of Contents

Preface	5
Introduction	6
1. Scope.....	8
1.1 Features Tested	8
1.2 Features Not Tested.....	8
2. References	9
2.1 The HART-Field Communications Protocol Specifications	9
2.2 Related Documents	9
3. Definitions	10
4. Symbols/Abbreviations	10
5. Approach	11
5.1 Testing Sequence.....	11
5.2 Conventions.....	11
5.3 Comparing Floating-Point Numbers	12
6. Test Definitions	13
6.1 UAL000 Confirm All Universal Commands Supported	13
6.2 UAL001 Read Dynamic Variables (Commands 1, 2, and 3)	15
6.3 UAL002 (Reserved).....	17
6.4 UAL003 Write Polling Address (Commands 6 and 7)	18
6.5 UAL004 Read Unique Identifier with Tag (Command 11)	26
6.6 UAL005 Write Message (Commands 12 and 17).....	28
6.7 UAL006 Write Tag Descriptor and Date (Commands 13 and 18)	30
6.8 UAL007 Verify Command 14 and 15 Response.....	33
6.9 UAL008 Write Final Assembly Number (Commands 16 and 19)	35
6.10 UAL009 Verify Write Protect.....	37
6.11 UAL010 (Reserved).....	41
6.12 UAL011 Read Device Variables (Command 9).....	43
6.13 UAL012 Read Dynamic Variable Classification (Command 8).....	51
6.14 UAL013 Write Long Tag (Commands 20 and 22)	53
6.15 UAL014 Read Unique Identifier (Command 0).....	57
6.16 UAL015 Read Unique Identifier With Long Tag (Command 21)	59
6.17 UAL038 Reset Configuration Changed Flag	61
6.18 UAL048 Read Additional Device Status	67
ANNEX A. Reusable Test Procedure Definitions	71
A.1 CyclePower ().....	71
A.2 IdentifyDevice ()	72
A.3 VerifyResponseAndByteCount (rc, bc)	72
A.4 TestValidFrame ()	73

A.5	VerifyNotWriteProtected ().....	73
A.6	VerifyDate (date).....	73
A.7	IssueCommand12 (msg, failurePoint)	74
A.8	IssueCommand13 (tag, desc, date, failurePoint)	74
A.9	IssueCommand16 (fan, failurePoint)	75
A.10	IssueCommand20 (ITag, failurePoint)	75
ANNEX B.	Failure Point Cross Reference	76
ANNEX C.	Revision History	78
C.1	Changes from Revision 5.0 to 5.1	78
C.2	Changes from Revision 4.1 to 5.0.....	78
C.3	Changes from Revision 4.0 to 4.1.....	78
C.4	Changes from Revision 3.0 to 4.0.....	79
C.5	Changes from Revision 2.0 to 3.0.....	80
C.6	Changes From Revision 1.2 to 2.0	80
C.7	Changes From Revision 1.1 to 1.2	81
C.8	Changes From Revision 1.0 to 1.1	81