BECKWITH ELECTRIC ®

IEC61850 PIXIT Protocol Implementation

Rev. 2.0a

FOR

M-3311A / M-3425A / M-4272

HUBBELL®

IEC 61850 (PIXIT) PROTOCOL IMPLEMENTATION

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REV	**1.0**	**1/09**
		Initial Release
REV	**2.0**	**4/12**
		Revise to make applicable to M-3311A, M-3425A and M-4272 relays.
REV	**2.0a**	**08/01/24**
		Updating logos and removing "Co. Inc.". No updates to points.

Protocol Implementation Document

Introduction

This document specifies the protocol implementation extra information for testing (PIXIT) of the IEC 61850 interface in M-3311A, M-3425A and M-4272.

Together with the PICS and the MICS the PIXIT forms the basis for a conformance test according to IEC 61850-10.

Contents of this document

Each Table specifies the PIXIT for each applicable ACSI service model as structured in IEC 61850-10.

PIXIT for Association Model	
Description	**Value / Clarification**
Maximum number of clients that can set-up an association simultaneously	4
TCP_KEEPALIVE value	7200 seconds
Lost connection detection time	675 seconds
Is authentication supported	N
What association parameters are necessary for successful association	Transport selector Y Session selector Y Presentation selector Y AP Title Y AE Qualifier Y
If association parameters are necessary for association, describe the correct values e.g.	Transport selector 0001 Session selector 0001 Presentation selector 00000001 AP Title na AE Qualifier na
What is the maximum and minimum MMS PDU size	Max MMS PDU size 16334 Min MMS PDU size 2K
What is the maximum startup time after a power supply interrupt	300 seconds
<additional items>	–

Table 1 – PIXIT for Association Model

PIXIT for Server Model	
Description	**Value / Clarification**
Which analogue value (MX) quality bits are supported (can be set by server)	Validity: Y Good, N Invalid, N Reserved, N Questionable N Overflow N OutofRange N BadReference N Oscillatory N Failure Y OldData N Inconsistent N Inaccurate Source: N Process N Substituted N Test N OperatorBlocked
Which status value (ST) quality bits are supported (can be set by server)	Validity: Y/N Good, N Invalid, N Reserved, N Questionable N BadReference N Oscillatory N Failure Y OldData N Inconsistent N Inaccurate Source: N Process N Substituted N Test N OperatorBlocked
What is the maximum number of data values in one GetDataValues request	50
What is the maximum number of data values in one SetDataValues request	50
<additional items>	–

Table 2 – PIXIT for Server Model

PIXIT for Data Set Model	
Description	**Value / Clarification**
What is the maximum number of data elements in one data set (compare ICD setting)	50
How many persistent data sets can be created by one or more clients	3
How many non-persistent data sets can be created by one or more clients	0
<additional items>	–

Table 3 – PIXIT for Data Set Model

PIXIT for Reporting Model	
Description	**Value / Clarification**
The supported trigger conditions are (compare PICS)	integrity Y data change Y quality change Y data update Y general interrogation Y
The supported optional fields are	sequence-number Y report-time-stamp Y reason-for-inclusion Y data-set-name Y data-reference Y buffer-overflow Y entryID Y conf-rev Y segmentation Y
Can the server send segmented reports	Y
Mechanism on second internal data change notification of the same analogue data value within buffer period (Compare IEC 61850-7-2 $14.2.2.9)	Send report immediately
Multi client URCB approach (compare IEC 61850-7-2 $14.2.1)	Each URCB is visible to all clients
What is the format of EntryID	Octet Strings
What is the buffer size for each BRCB or how many reports can be buffered	TBD
Pre-configured RCB attributes that cannot be changed online when RptEna = FALSE (see also the ICD report settings)	NONE
May the reported data set contain: - structured data objects? - data attributes? - timestamp data attributes?	 Y Y Y will not be included in a dchg report
What is the scan cycle for binary events? Is this fixed, configurable	TBD Mseconds Fixed
<additional items>	

Table 4 – PIXIT for Reporting Model

PIXIT for Logging Model	
Description	**Value / Clarification**
What is the default value of LogEna (Compare IEC 61850-8-1 $17.3.3.2.1, the default value should be FALSE)	FALSE
What is the format of EntryID (Compare IEC 61850-8-1 $17.3.3.3.1)	NA
If there are multiple Log Control Blocks that specify the Journaling of the same MMS NamedVariable and TrgOps and the Event Condition (Compare IEC 61850-8-1 $17.3.3.3.2)	NA
Pre-configured LCB attributes that cannot be changed online	NA
\<additional items\>	

Table 5 – PIXIT for Logging Model

PIXIT for Control Model	
Description	**Value / Clarification**
What control modes are supported (compare PICS)	Y status-only Y direct-with-normal-security N sbo-with-normal-security N direct-with-enhanced-security N sbo-with-enhanced-security
Is the control model fixed, configurable and/or online changeable?	Fixed
Is Time activated operate (operTm) supported	Y
Is "operate-many" supported	N
What is the behavior of the DUT when the test attribute is set in the SelectWithValue and/or Operate request	e.g. DUT ignores the test value and execute the command as usual
What are the conditions for the time (T) attribute in the SelectWithValue and/or Operate request	e.g. DUT ignores the time value and execute the command as usual
Is pulse configuration supported	N
What is the behavior of the DUT when the check conditions are set Is this behavior fixed, configurable, online changeable?	N synchrocheck N interlock-check Fixed
What additional cause diagnosis are supported	N Blocked-by-switching-hierarchy N Select-failed N Invalid-position N Position-reached N Parameter-change-in-execution N Step-limit N Blocked-by-Mode N Blocked-by-process N Blocked-by-interlocking N Blocked-by-synchrocheck N Command-already-in-execution N Blocked-by-health N 1-of-n-control N Abortion-by-cancel N Time-limit-over N Abortion-by-trip
How to force a "test-not-ok" respond with SelectWithValue request?	

Table 6 – PIXIT for Control Model (1 of 2)

PIXIT for Control Model	
Description	**Value / Clarification**
How to force a "test-not-ok" respond with Select request?	
How to force a "test-not-ok" respond with Operate request?	DOns: SBOns: DOes: SBOes:
Which origin categories are supported?	
What happens if the orCat is not supported?	DOns: SBOns: DOes: SBOes:
Does the IED accept an selectwithvalue/operate with the same ctlVal as the current status value?	DOns: N SBOns: N DOes: N SBOes: N
Does the IED accept a select/operate on the same control object from 2 different clients at the same time?	DOns: N SBOns: N DOes: N SBOES: N
Does the IED accept a select/selectwithvalue from the same client when the control object is already selected (tissue 334)	SBOns: N SBOES: N
Is for SBOes the internal validation performed during the SelectWithValue and/or Operate step?	NA
Can a control operation be blocked by Mod=Off or Blocked	N
Does the IED support local / remote operation?	N
<additional items>	

Table 6 – PIXIT for Control Model (2 of 2)

BECKWITH ELECTRIC

6190 118th Avenue North • Largo, Florida 33773-3724 U.S.A.
PHONE (727) 544-2326
beckwithelectricsupport@hubbell.com
www.beckwithelectric.com
ISO 9001:2015

A proud member of the Hubbell family.