

INTERNATIONAL ELECTROTECHNICAL COMMISSION
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IEC 62439-7
Edition 1.0 2011-12

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INDUSTRIAL COMMUNICATION NETWORKS –
HIGH AVAILABILITY AUTOMATION NETWORKS –
Part 7: Ring-based Redundancy Protocol (RRP)

RESEAUX DE COMMUNICATION INDUSTRIELS –
RESEAUX DE HAUTE DISPONIBILITE POUR
L'AUTOMATION – Partie 7: Protocole de
redondance pour réseau en anneau (RRP)

CORRIGENDUM 1

Corrections to the French version appear after the English text.

Les corrections à la version française sont données après le texte anglais.

10 RRP Management Information Base (MIB)

Replace the existing text in Clause 10 with the following text (note that only sections highlighted in yellow have actually been changed):

```
-- *****
IEC-62439-7-MIB DEFINITIONS ::= BEGIN

-- *****
-- Imports
-- *****

IMPORTS
    OBJECT-IDENTITY,
    OBJECT-TYPE,
    TimeTicks,
    Counter32,
    Unsigned32,
    Counter64,
    VISIBLE-STRING,
    INTEGER                FROM SNMPv2-SMI
    Boolean                FROM HOST-RESOURCES-MIB
    MacAddress             FROM BRIDGE-MIB
    iso                    FROM RFC1155-SMI;

-- *****
-- Declaration of TIMEOFDAY
-- *****
TIMEOFDAY ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION "
        The IEC 61158-5-21 defines the structure of
        the TIMEOFDAY as a data type numeric
        identifier 12.
    "
    SYNTAX      VISIBLE STRING (SIZE (6))

-- *****
```

```
-- Root OID
-- *****
iec62439  MODULE-IDENTITY
    LAST-UPDATED "201306110000Z" -- June 11, 2013
    ORGANIZATION "IEC/SC 65C"
    CONTACT-INFO "
        International Electrotechnical Commission
        IEC Central Office
        3, rue de Varembé
        P.O. Box 131
        CH - 1211 GENEVA 20
        Switzerland
        Phone: +41 22 919 02 11
        Fax: +41 22 919 03 00
        email: info@iec.ch
    "

    DESCRIPTION "
        This MIB module defines the Network Management interfaces
        for the Redundancy Protocols defined by the IEC
        standard 62439.
    "

    REVISION "201306110000Z" -- June 11, 2013
    DESCRIPTION "
        Consistency adjustment with other parts of IEC 62439
    "

    REVISION "200811100000Z" -- November 10, 2008
    DESCRIPTION "
        Separation of IEC 62439 into a suite of documents.
        This MIB applies to IEC 62439-7, added RRP functionality.
    "

    REVISION "200708240000Z" -- August 24, 2007
    DESCRIPTION "
        Initial version of the Network Management interface for the
        Ring-based Redundancy Protocol
    "

    ::= { IEC 62439 }

-- *****
-- Redundancy Protocols
-- *****
mrp      OBJECT IDENTIFIER ::= { iec62439 1 }
prp      OBJECT IDENTIFIER ::= { iec62439 2 }
crp      OBJECT IDENTIFIER ::= { iec62439 3 }
brp      OBJECT IDENTIFIER ::= { iec62439 4 }
drp      OBJECT IDENTIFIER ::= { iec62439 5 }
rrp      OBJECT IDENTIFIER ::= { iec62439 6 }

-- *****
-- Objects of the RRP Network Management
-- *****

ServiceID OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-write
    STATUS      mandatory
    DESCRIPTION "
        specifies information sufficient for local
        identification of the RRP device that will
        convey the service
    "

    ::= { rrp 1 }

InvokeID   OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-write
    STATUS      mandatory
    DESCRIPTION "
        specifies the invocation of the service
    "

    ::= { rrp 2 }

DeviceAddress OBJECT-TYPE
    SYNTAX      INTEGER
```

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```

MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION      "
                specifies the value for the RRP device address
                "

 ::= { rrp 3 }

DeviceFlags      OBJECT-TYPE
SYNTAX          BITS {
                DeviceAddressCollision(0),
                DeviceStateChanged(1)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the flags for events that occurred
                in a local device
                "

 ::= { rrp 4 }

DeviceState      OBJECT-TYPE
SYNTAX          INTEGER {
                Invalid(0),
                SA(1),
                LNM(2),
                GD(3),
                RNMP(4),
                RNMS(5)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the device state of the RRP device
                "

 ::= { rrp 5 }

DeviceUID        OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the unique 8-octet identification that
                identifies a RRP device in a network
                "

 ::= { rrp 6 }

DeviceUIDRport1  OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the UID of the device that is linked
                through the R-port1
                "

 ::= { rrp 7 }

DeviceUIDRport2  OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the UID of the device that is linked
                through the R-port2
                "

 ::= { rrp 8 }

MACAddress       OBJECT-TYPE
SYNTAX          MacAddress
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION      "
                specifies the MAC address of the RRP device
                "

 ::= { rrp 9 }

Rport1Information OBJECT-TYPE
SYNTAX          BITS {
                PortLinkDown(0),

```

```

        PortCFMFamily(1),
        PortWaitADV(2),
        PortWaitML(3)
        PortCFM(4)
    }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the port information for R-port1
                "

 ::= { rrp 10 }

Rport2Information OBJECT-TYPE
SYNTAX          BITS {
                PortLinkDown(0),
                PortCFMFamily(1),
                PortWaitADV(2),
                PortWaitML(3)
                PortCFM(4)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the port information for R-port2
                "

 ::= { rrp 11 }

Version          OBJECT-TYPE
SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the protocol version of the RRP device
                "

 ::= { rrp 12 }

DeviceType       OBJECT-TYPE
SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the local device type that represents
                the general function of the device
                "

 ::= { rrp 13 }

DeviceDescription OBJECT-TYPE
SYNTAX          VISIBILITY-STRING (SIZE(1..16))
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies a description of the local device
                "

 ::= { rrp 14 }

FamilyResWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the time interval between sending the FamilyReq
                frame and receiving the FamilyRes frame
                "

 ::= { rrp 15 }

AdvThisWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the time interval between sending the MediaLinked
                frame and receiving the AdvThis frame
                "

 ::= { rrp 16 }

AckRMSWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write

```

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```

STATUS          mandatory
DESCRIPTION      "
                  specifies the time interval between sending the RingStart
                  frame and receiving the AckRNMS frame
                  "

 ::= { rrp 17 }

RingStateChangeTimeout OBJECT-TYPE
SYNTAX           Unsigned32
MAX-ACCESS       read-write
STATUS           mandatory
DESCRIPTION      "
                  specifies the timeout to generate event for changing
                  RNMP device state
                  "

 ::= { rrp 18 }

DiagnosticInformation OBJECT-TYPE
SYNTAX           INTEGER {
                  NetworkInformation(1),
                  PathTableInformation(2)
                  }
MAX-ACCESS       write-only
STATUS           mandatory
DESCRIPTION      "
                  specifies the type of diagnostic information
                  "

 ::= { rrp 19 }

-- *****
-- Objects of the RRP Network Information
-- *****

NetworkTopology OBJECT-TYPE
SYNTAX           INTEGER {
                  Invalid(0),
                  NET_TPG_SA(1),
                  NET_TPG_LINE(2),
                  NET_TPG_RING(3)
                  }
MAX-ACCESS       read-only
STATUS           mandatory
DESCRIPTION      "
                  specifies the type of network topology
                  "

 ::= { rrp 20 }

CollisionCnt OBJECT-TYPE
SYNTAX           INTEGER
MAX-ACCESS       read-only
STATUS           mandatory
DESCRIPTION      "
                  specifies the device address collision count
                  for remote devices
                  "

 ::= { rrp 21 }

DeviceCnt OBJECT-TYPE
SYNTAX           INTEGER
MAX-ACCESS       read-only
STATUS           mandatory
DESCRIPTION      "
                  specifies the total number of devices on the network
                  "

 ::= { rrp 22 }

TopologyChangeCnt OBJECT-TYPE
SYNTAX           INTEGER
MAX-ACCESS       read-only
STATUS           mandatory
DESCRIPTION      "
                  specifies the topology change count
                  "

 ::= { rrp 23 }

LastTopologyChangeTime OBJECT-TYPE
SYNTAX           TIMEOFDAY
MAX-ACCESS       read-only

```

```

STATUS          mandatory
DESCRIPTION     "
                specifies the date and time at which the network topology
                was last changed
                "

 ::= { rrp 24 }

RNMPDeviceUID   OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the UID of the device selected as the RNMP
                on the network
                "

 ::= { rrp 25 }

RNMSDeviceUID   OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the UID of the device selected as the RNMS
                on the network
                "

 ::= { rrp 26 }

LNMDDeviceUIDRport1 OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the UID of the device selected as the LNM
                in the R-port1 direction
                "

 ::= { rrp 27 }

LNMDDeviceUIDRport2 OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the UID of the device selected as the LNM
                in the R-port2 direction
                "

 ::= { rrp 28 }

NetworkFlags     OBJECT-TYPE
SYNTAX          BITS {
                NetworkTopologyChanged(0),
                DeviceAddressCollisionInNetwork(1),
                DeviceJoinedNetwork(2),
                DeviceLeftNetwork(3)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the flags for events that occurred
                in the network
                "

 ::= { rrp 29 }

-- *****
-- Objects of the RRP Path Table Information
-- *****

PathTableInfo    OBJECT-TYPE
SYNTAX          SEQUENCE OF PathTableInfoEntry
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                Path Table in the form of an array table containing
                the path information for each RRP device on the network
                "

 ::= { rrp 30 }

PathTableEntry   OBJECT-TYPE
SYNTAX          PathTableInfoEntry

```

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```

MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "Row of Path Table Information"
INDEX          { PathTableIndex }
 ::= { PathTableInfo 1 }

PathTableInfoEntry ::= SEQUENCE {
    pathDevAddress      INTEGER,
    pathHopCntRp1       INTEGER,
    pathHopCntRp2       INTEGER,
    pathPreferRp        INTEGER,
    pathDstRp           INTEGER,
    pathDevState        INTEGER,
    pathMACAddress      MacAddress,
    pathRp1Info         INTEGER,
    pathRp2Info         INTEGER,
    pathVersion         INTEGER,
    pathDevType         INTEGER,
    pathDevDesc         VISIBLE STRING (SIZE (1..16)),
    pathDevUID          Counter64,
    pathDevUIDRp1       Counter64,
    pathDevUIDRp2       Counter64
}

END
-- *****
-- EOF
-- *****

```

Corrections à la version française:

10 Base d'informations d'administration RRP (MIB)

Remplacer le texte existant de l'Article 10 par le texte suivant (à noter que seules les sections surlignées en jaune ont été effectivement modifiées):

```

-- *****

IEC-62439-7-MIB DEFINITIONS ::= BEGIN

-- *****
-- Imports
-- *****

IMPORTS
    OBJECT-IDENTITY,
    OBJECT-TYPE,
    TimeTicks,
    Counter32,
    Unsigned32,
    Counter64,
    VISIBLE-STRING,
    INTEGER                      FROM SNMPv2-SMI
    Boolean                     FROM HOST-RESOURCES-MIB
    MacAddress                   FROM BRIDGE-MIB
    iso                          FROM RFC1155-SMI;

-- *****
-- Declaration of TIMEOFDAY
-- *****
TIMEOFDAY ::= TEXTUAL-CONVENTION
    STATUS          current
    DESCRIPTION     "
        The IEC 61158-5-21 defines the structure of
        the TIMEOFDAY as a data type numeric
        identifier 12.
    "
    SYNTAX          VISIBLE STRING (SIZE (6))

```

```
-- *****
-- Root OID
-- *****
```

```
iec62439  MODULE-IDENTITY
          LAST-UPDATED "201306110000Z" -- June 11, 2013
          ORGANIZATION "IEC/SC 65C"
          CONTACT-INFO "
                        International Electrotechnical Commission
                        IEC Central Office
                        3, rue de Varembe
                        P.O. Box 131
                        CH - 1211 GENEVA 20
                        Switzerland
                        Phone: +41 22 919 02 11
                        Fax: +41 22 919 03 00
                        email: info@iec.ch
                    "
```

```
DESCRIPTION "
    This MIB module defines the Network Management interfaces
    for the Redundancy Protocols defined by the IEC
    standard 62439.
"
```

```
REVISION "201306110000Z" -- June 11, 2013
```

```
DESCRIPTION "
    Consistency adjustment with other parts of IEC 62439
"
```

```
REVISION "200811100000Z" -- November 10, 2008
```

```
DESCRIPTION "
    Seperation of IEC 62439 into a suite of documents.
    This MIB applies to IEC 62439-7, added RRP functionality.
"
```

```
REVISION "200708240000Z" -- August 24, 2007
```

```
DESCRIPTION "
    Initial version of the Network Management interface for the
    Ring-based Redundancy Protocol
"
```

```
::= { IEC 62439 }
```

```
-- *****
-- Redundancy Protocols
-- *****
```

```
mrp      OBJECT IDENTIFIER ::= { iec62439 1 }
prp      OBJECT IDENTIFIER ::= { iec62439 2 }
crp      OBJECT IDENTIFIER ::= { iec62439 3 }
brp      OBJECT IDENTIFIER ::= { iec62439 4 }
drp      OBJECT IDENTIFIER ::= { iec62439 5 }
rrp      OBJECT IDENTIFIER ::= { iec62439 6 }
```

```
-- *****
-- Objects of the RRP Network Management
-- *****
```

```
ServiceID OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-write
    STATUS      mandatory
    DESCRIPTION "
        specifies information sufficient for local
        identification of the RRP device that will
        convey the service
    "
```

```
::= { rrp 1 }
```

```
InvokeID OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-write
    STATUS      mandatory
    DESCRIPTION "
        specifies the invocation of the service
    "
```

```
::= { rrp 2 }
```

```
DeviceAddress OBJECT-TYPE
```


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```

SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION      "
                specifies the value for the RRP device address
                "

 ::= { rrp 3 }

DeviceFlags      OBJECT-TYPE
SYNTAX          BITS {
                DeviceAddressCollision(0),
                DeviceStateChanged(1)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the flags for events that occurred
                in a local device
                "

 ::= { rrp 4 }

DeviceState      OBJECT-TYPE
SYNTAX          INTEGER {
                Invalid(0),
                SA(1),
                LNM(2),
                GD(3),
                RNMP(4),
                RNMS(5)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the device state of the RRP device
                "

 ::= { rrp 5 }

DeviceUID        OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the unique 8-octet identification that
                identifies a RRP device in a network
                "

 ::= { rrp 6 }

DeviceUIDRport1  OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the UID of the device that is linked
                through the R-port1
                "

 ::= { rrp 7 }

DeviceUIDRport2  OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION      "
                specifies the UID of the device that is linked
                through the R-port2
                "

 ::= { rrp 8 }

MACAddress       OBJECT-TYPE
SYNTAX          MacAddress
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION      "
                specifies the MAC address of the RRP device
                "

 ::= { rrp 9 }

Rport1Information OBJECT-TYPE
SYNTAX          BITS {

```

```

        PortLinkDown(0),
        PortCFMFamily(1),
        PortWaitADV(2),
        PortWaitML(3)
        PortCFM(4)
    }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the port information for R-port1
                "
 ::= { rrp 10 }

Rport2Information OBJECT-TYPE
SYNTAX          BITS {
                PortLinkDown(0),
                PortCFMFamily(1),
                PortWaitADV(2),
                PortWaitML(3)
                PortCFM(4)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the port information for R-port2
                "
 ::= { rrp 11 }

Version          OBJECT-TYPE
SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the protocol version of the RRP device
                "
 ::= { rrp 12 }

DeviceType       OBJECT-TYPE
SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the local device type that represents
                the general function of the device
                "
 ::= { rrp 13 }

DeviceDescription OBJECT-TYPE
SYNTAX          VISIBL STRING (SIZE(1..16))
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies a description of the local device
                "
 ::= { rrp 14 }

FamilyResWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the time interval between sending the FamilyReq
                frame and receiving the FamilyRes frame
                "
 ::= { rrp 15 }

AdvThisWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the time interval between sending the MediaLinked
                frame and receiving the AdvThis frame
                "
 ::= { rrp 16 }

AckRNMSWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32

```