# Motion control – whats new ?

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# History

- Axis Record, 2017, December, Abington:
  Lost connection to community
  Lost soft motor

- 2018: Integrate goodies into motor
  code base and phase out axis.

# Goodies from axis

- Zero-commissioning
  Configure all parameters in TwinCAT
  (Today nearly all)

- Read them out from controller and put
  into the motorRecord fields. (Soft limits,
  deadband, velocities/accelerations)

- Deployed at HZB V20
  (Some minor fixes since then, not deployed)

# Goodies-2

- The -MsgTxt PV:
  Shows additional information:
  'E: Controller error 4650'
  'W: Both limit switches'
  'I: Homing'

- However, 'W:' is unrelated to the STAT field.
  Should be 'I:' instead ?!

# TwinCAT

- TwinCAT

  - Projects are under Git
  - Commissioning workflow on confluence

- Recommended Ethercat terminals:
   on confluence

- Anything missing?

# EPICS Record Alarms

- All EPICS records have a field:
  STAT
  SEVR

- STAT == 0 means "no alarm"

- SEVR is valid when STAT != 0.
  E.g. distinguish between Major/Minor

# The STAT field

- EPICS base: enum, 20 values.

```
0 == epicsAlarmNone
(read, write)
(hihi, high, lolo, low)
7  == epicsAlarmState
9  == epicsAlarmCom
14 == epicsAlarmLink
17 == epicsAlarmUDF
```

# The SEVR field

- EPICS Base, enum, 4 values.

```
0 == epicsSevNone
1 == epicsSevMinor
2 == epicsSevMajor
3 == epicsSevInvalid
```

# STAT + SEVR

- Combinations

```
AlarmUDF,   SevInvalid
AlarmHigh,  SevMajor/SevMinor/SevNone
AlarmLow,   SevMajor/SevMinor/SevNone
AlarmCom,   SevInvalid
AlarmState, SevMajor/SevMinor/SevNone
```

# Alarms, what, when

- AlarmUDF
  (TCP/IP) connection never established

- AlarmCom:
  (TCP/IP) connection lost

- AlarmState:
  "motor problem"

- AlarmHigh,Low:
  Soft/hard limit (See HLSV)

- AlarmState:
  MISS (See MISV)

# Nicos 2017

- Suggestion: 4 States in control screen:
  OK  BUSY  WARN  ERROR

```
if (STAT == epicsAlarmComm)
  status = ERROR
else if (STAT !=0 && SEVR ==MAJOR)
  status = ERROR
else if (!DMOV || MOVN)
  status = BUSY
else if (MISS)
  status =Warn NotReache
else if (LVIO || LLS || HLS)
  status = WARN
else
  status = OK
```

# TODO

- Check STAT & SEVR handling in NICOS

- Is the code @ V20 under a public Git ?

- Amplifier control for Berlin V20
  (from Nicos)

- Replace 'W:' with 'I:' in the EPICS motor

- Want to have Nicos on my Mac ;-)