

Hi4 Function Training

User Coordinate

2003. 5; revision 2003. 6. 30



1. Coordinate System of Hi4 controller

- ① Robot coordinate system : Coordinate puts robot base frame.
- ② Base coordinate system : Coordinate puts the center of traverse axis.
- ③ Tool coordinate system : Coordinate puts the current orientation of TCP.
- ④ Encoder coordinate system : All value are each axis position.
- ⑤ User coordinate system : Coordinate can put anywhere set by user.

2. Where to use coordinate system

- ① Select "Pose REC Type=<Base,Robot,Enco,U,Un>" in PF2"system" > {1: User parameter}
- ② All pose variables support base, robot, encoder, user coordinate system with postfix character as $Pn=(\dots)$, $Pn=(\dots)R$, $Pn=(\dots)E$, $Pn=(\dots)U$, $Pn=(\dots)Un$ and the hidden pose of step.
Base coordinate
- ③ All shift variables support base, robot, tool, user coordinate system with postfix character as $Rn=(\dots)$, $Rn=(\dots)R$, $Rn=(\dots)T$, $Rn=(\dots)U$ and $Rn=(\dots)Un$
Base coordinate

3. User coordinate system

- ① U coordinate system : Coordinate number does not fix in recorded pose.
In running state, this coordinate number depends on "Select user coordinate=[n]" in the condition set.
Also this coordinate number can be changed with SELUCRD command in HR-BASIC.
- ② Un coordinate system : Coordinate number is fixed itself as $Pn=(\dots)U2$, $Rn=(\dots)U2$ and a hidden pose.

4. Hot to set the user coordinate

4.1 Method with teach pendant

- ① Make a program with 3 points as located on origin, x-direction and XY plane.
- ② press PF2"System" > {2: Control parameter} > {12: Coordinate setting} > {1: User coordinate}

```
14:39:38 ** User Coordinate ** A:0 S:3
User Coordinate Number      = [ 1]
Program No. for registration = [100]

Defined User-Coordinate
{1, 2, 3, 4, 7, 10}
User-coordinate pose : number 1
Origin: {X=100.00, Y=1786.00, Z=2040.00}
X-Dir.: {X=1.00 , Y=0, Z=0}
Y-dir.: {X=0 , Y=1.00, Z=0}
Select and Enter number. Press [SET]
>[1 - 10]_
Delete Execute
```

4.2 Command with HR-BASIC

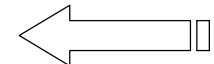
MKUCRD <coord. number>,<origin pose>,<X dir. pose>,<XY plane pose>

5. How to teach program with U or Un

- ① Select "Pose REC Type=<U>", This is possible only engineering mode.
 ➔ Press PF2"system" > {1: User parameter}

```

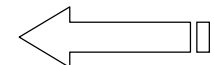
14:39:38 **User configuration ** A:0 S:3
1: Display language(언어)=<한글, English>
2: Pose REC type =<Base, robot, Enco, U, Un>
3: Robot start type=<In, Ex, Remote, start>
4: Cursor Change on AutoMode=<DSBL, ENBL>
~~~~~
Press [SHIFT]+[<->] Key.
>_
Previous Next End
    
```



- ② Set "Select User coordinate=[n]" by teach pendant
- ③ or you can use SELUCRD command in HR-BASIC : SELUCRD <coordinate number>

```

14:39:38 *** Condition set *** A:0 S:3
1: Cycle type =<1Step, 1Cycle, Continue>
~~~~~
7: Interpolation base =<R-tool, S-tool>
8: Select User coordinate = [ 0 ]
~~~~~
Enter number and Press [SET]
>[0(=Robot), 1, 2, 3, 4, 7, 10]_
AppliCnd End
    
```



- ④ Record step by pressing [REC] key

6. How to change coordinate system for recorded pose

- ① Press [QuickOpen] key

```
14:39:38 *** Step Pose Data *** A:0 S:3
POSE OF CURRENT STEP                      Crd:1
X: [      10.00]mm
Y: [      10.00]mm
Z: [      10.00]mm
RX: [         0]deg
RY: [         0]deg
RZ: [         0]deg
Coord.: <Base, Robot, Encoder, U, Un> U[ 1]
Robot Configuration: <Define, Self-cfg>
<Front, Rear> <Up, Down> <Flip, Non-flip>
within !PI!: S=<Y, N> R1=<Y, N> R2=<Y, N>
Select and Enter number. Press [SET]
>_
Save
```

- ② If you select "Pose REC type=<U>" at "System" > {1: User parameter},
You can convert a coordinate system to U only.
- ③ Also if you select "Pose REC type"=<Un> at "System" > {1: User parameter},
You can convert a coordinate system to Un only.
- ④ Un coordinate system used to special application
as where require multiple user coordinate system at each step in the same program.