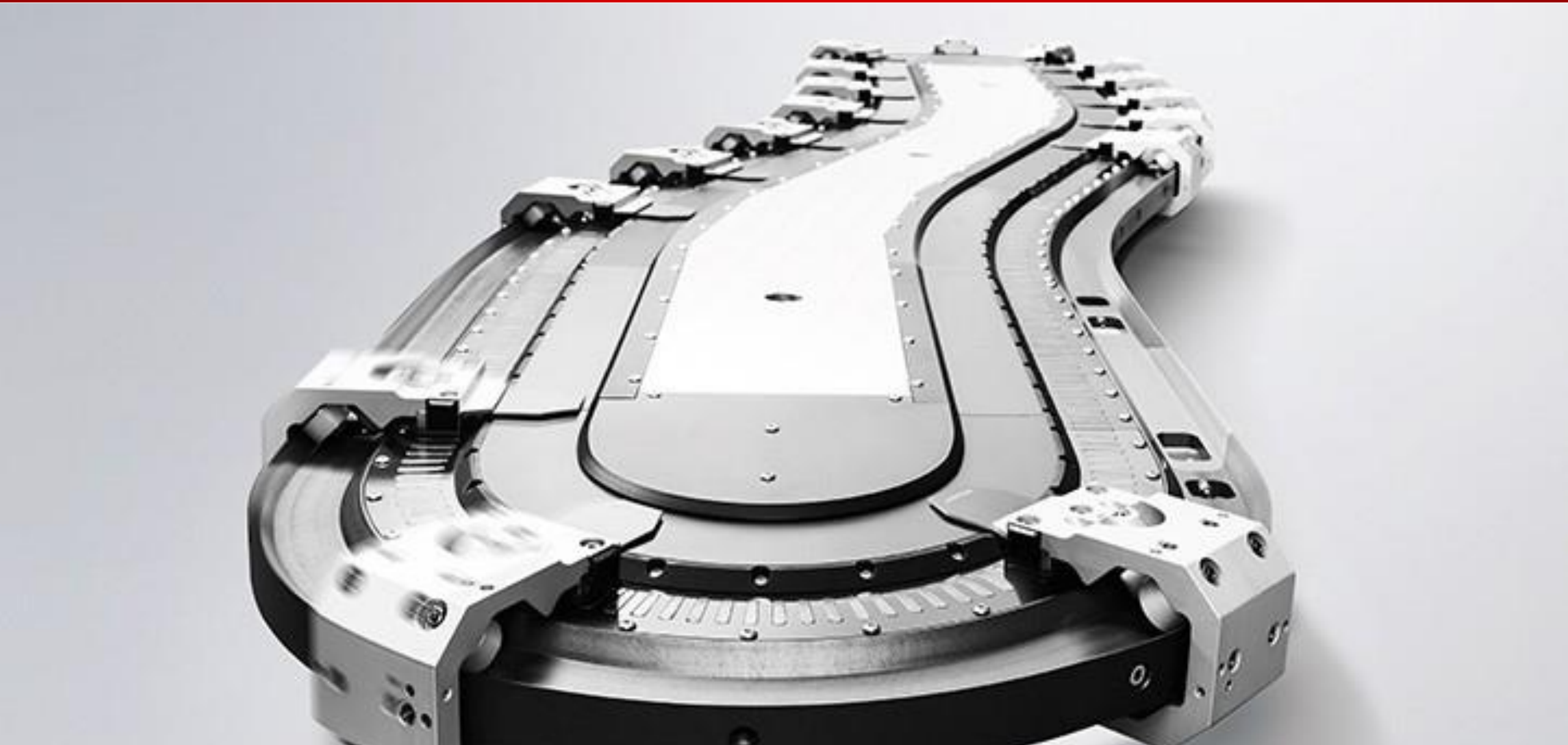
XTS TRANSPORT LAYER – DEMO APPLICATION

BECKHOFF



XTS TRANSPORT LAYER – DEMO APPLICATION

BECKHOFF

1. APPLICATION Transport
2. APPLICATION Members

- **Transport specification:**
  - Output **500 – 550** movers/minute
  - Placing of N [1 to 12] items on N movers
    - INFEED: items are placed from transfer-system
    - Transfer-System is either internal or external. (delivers parts in places)
    - N varies in place and count
  - Sending of movers for N items to INFEED
    - BUFFER_INFEED: placement mask is written by transfer-system.
  - INFEED sends 12 movers or less at a time
  - BUFFER_OUTFEED acts as distributor to OUTFEED

- **Transport specification:**
  - OUTFEED (max 24 mover):
    - OUTFEED must work 24 mover in sync
    - OUTFEED must work 2x12 mover individually
    - → OUTFEED_R1
    - → OUTFEED_R2
  - 180° curve restrictions.
    - Max velocity 1500 mm/s
  - Vertical system (return track has no process)
    - No queue in 180° curve
  - Return track velo must be maximum

- **Transport specification:**
  - Movers must be accelerated to max velocity once the 180° curve is passed:
    - SENDER_FAST: sends all passing movers to SENDER_BUFFER_INFEED
  - Movers must not queue up in 180° curves:
    - SENDER_BUFFER_INFEED: only send as many movers as requested in ListEntry
      - ListEntry is written by INFEED when movers enter

- **Transport Members:**
  - XTS_TRANSPORT_LAYER requires some AddOns
    - How to group single XtsStations?
      - fb_ProcessCollector
        - Grouping of XtsStations (StationLast to StationFirst)
          see XtsStation_Placement_PARALLEL.pdf in doc folder of this project.
    - How to write dedicated process procedures?
      - fb_Instance
        - Procedures of instances
    - How to forward ListEntries from Transfer-System and/or processes
      - fb_Process_LinkedListCtrl
      - Transfer-System uses BUFFER_INFEED's LinkedList (AddTail)

- **Transport Members:**
  - How many process instances do I need?
    - **TransferSystem**
      - simulated list entries for bitmask of XtsStations
      - writes into LinkedList of BUFFER_INFEED (bitmask with used bits 0-11)
    - **BUFFER_INFEED**
      - Checks linked list for new entries
      - sends required amount of movers to INFEED
      - Writes into LinkedList of INFEED

- **Transport Members:**
  - How many process instances do I need?
    - **INFEED**
      - Checks LinkedList for new entries
      - Starts infeed of movers according to bitmask in list entry.
      - Writes a copy of the list entry into LinkedList of SENDER_BUFFER_INFEED
      - WORK, starts process
      - FINISH, ends process
      - Sends out movers to BUFFER_OUTFEED
    - **BUFFER_OUTFEED**
      - checks the assigned XtsStation for new mover
      - Sends single mover to output
      - Internal counter is keeping track of the 24 possible target XtsStations

- **Transport Members:**
  - How many process instances do I need?
    - **OUTFEED_R1**
      - Checks if all 12 XtsStations have a mover waiting
      - Infeed of 12 movers
      - Work 12 movers
      - Send 12 movers to SENDER_FAST
    - **OUTFEED_R2**
      - Checks if all 12 XtsStations have a mover waiting
      - Infeed of 12 movers
      - Work 12 movers
      - Send 12 movers to SENDER_FAST

- **Transport Members:**
  - How many process instances do I need?
    - **SENDER_FAST**
      - checks the assigned XtsStation for new mover
      - Sends mover to SENDER_BUFFER_INFEED
    - **SENDER_BUFFER_INFEED**
      - Checks ProcessList for new entry from INFEED
      - Sends the amount (written in ListEntry) of movers to BUFFER_INFEED